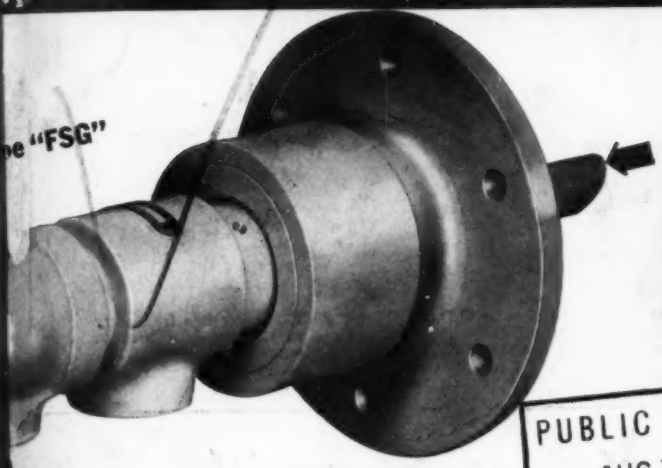
The Paper Industry



ROTARY UNION
REG. TRADE MARK

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DETROIT

The **Most Compact**
Most Economical
Longest Lasting
revolving steam joint you can buy . . .

This is the joint that is integral with the journal, has a minimum of overhang, and requires no lubrication or adjustments.

The Type "FSG" ROTARY UNION* was designed especially for the high speeds, pressures, and temperatures, and the continuous heavy duty service required on paper mill dryers, calenders, and digesters. The unit is flanged directly to the journal and revolves with the drum itself. Its special heavy duty, low friction, metal-backed graphite bearing requires no lubrication and withstands high pressures and temperatures. Two-point support gives better alignment and prevents wearing through and falling off of syphon pipes, eliminating costly down time.

Contact our nearest office for additional information or write Dept. 12P for our Catalog.

*There are 40 standard sizes and types of ROTARY UNIONS for every sealing need.

HERE *Good Connections* COUNT"

PERFECTING SERVICE COMPANY

332 Atando Avenue (Home Office and Factory), Charlotte, N. C.
Offices in Atlanta • Chicago • Cleveland • Philadelphia • Providence
New York • Montreal • Toronto

*REG. U.S. PAT. OFF.

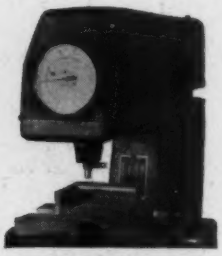
No need to gamble on evaporator tubes!

The Timken Company shows you what you get

Specifications for 3½% and 5% nickel tubes are available to you with no obligation.

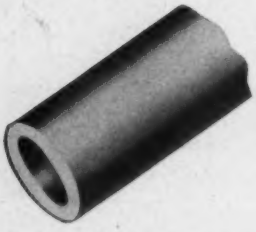
Special chemical composition test of your order is made at your request.

In flaring test, tube I.D. must expand 20% without cracking or showing flaws.



Tubes must have Rockwell hardness number not exceeding B89.

Each tube is tested under hydrostatic pressure of 1,000 p.s.i. before shipment.



Tubes must be free from defects and have workmanlike finish. Inspection is rigid.

Tolerances in O.D., wall thickness, cut length are held to a minimum.

Purchaser has free entry to plant for inspection of work on contract.

. . . and guarantees you'll get it!

THERE'S no guesswork in buying black liquor evaporator tubes when you buy them from the Timken Company. Specifications for Timken® 3½% and 5% nickel steel tubes show you exactly what you get. They cover every essential point—chemical composition, physical properties, inspection methods and tests to which the tubes are subjected (see above).

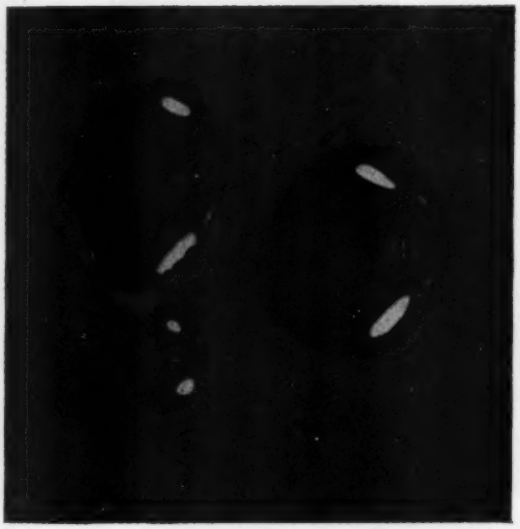
And the Timken Company guarantees that every order of tubes will meet these high specifications. Quality is controlled at every step. Tubes are tested and inspected before shipment. As a result, you reduce tube replacement costs, save tube sheet wear, cut downtime. Write on your company letterhead for 3½% and 5% nickel tube specifications. The Timken Roller Bearing Company, Steel and Tube Div., Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

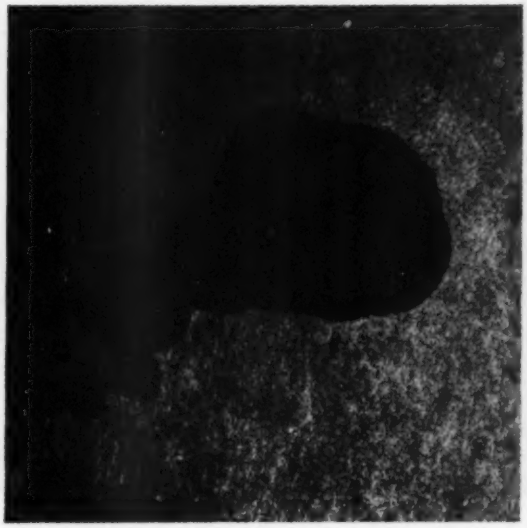
SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

BLOTTER TEST PROVES

Kelsize Solution Controls Penetration of Porous Surface



This unretouched photograph shows a 1% solution of Kelsize twenty minutes after being puddled on blotter. Note how solution remains on surface of blotter. This test illustrates that Kelsize is an excellent material for controlling penetration and strike through of aqueous solutions, thus increasing the efficiency of adhesive or surface sizing solutions by retaining them at the area of application.

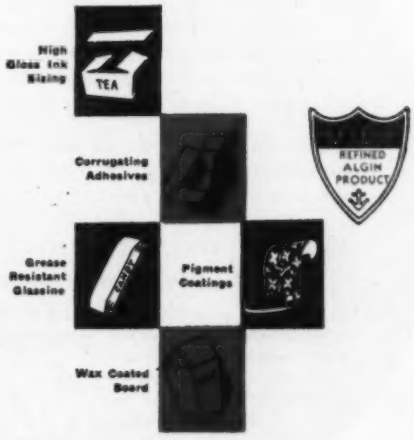


Here is unretouched photograph of water, without Kelsize, on piece of same blotter, taken seconds after water was placed on blotter. Note how water has immediately passed into blotter compared to controlled penetration of Kelsize solution. Proof that Kelsize and Kelgin are superior surface control agents and regulate surface density and penetration — precisely and effectively.

KELSIZE®
and
KELGIN®

Superior Surface Control Agents

Due to their colloidal and film forming properties, Kelsize and Kelgin effectively control penetration of adhesives, starch solutions, and most water base solutions.



products of **KELCO** *company*

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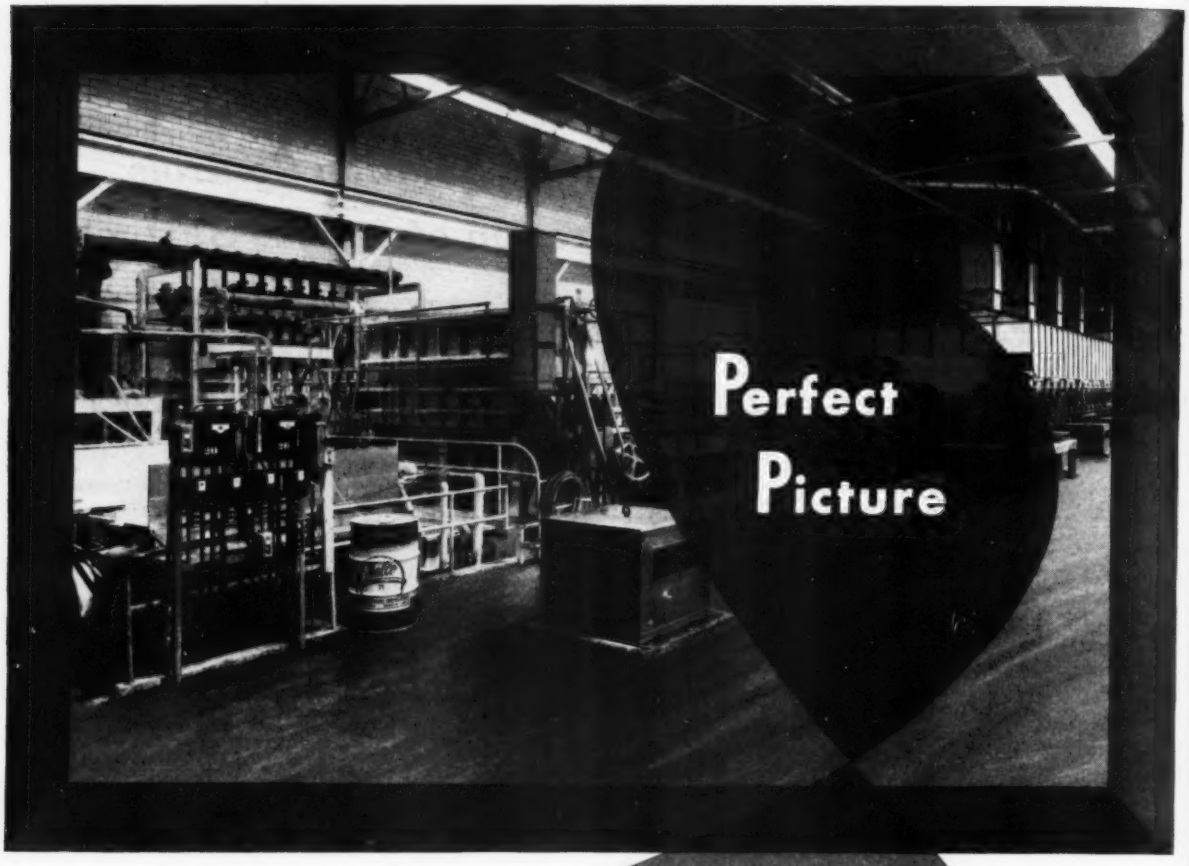

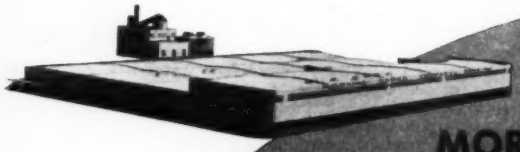

(for *Nalco*—and MORAINE PAPER COMPANY)

THE ultramodern building of the Moraine Paper Company Division of the American Envelope Company at West Carrollton, Ohio, houses equally modern, efficient equipment for fine paper-making. In addition to Nalco 71 antifoam, pictured above being applied at the Bird screens with a Nalco Feedrator, Moraine also uses Nalco 918 in the bleach plant and at the repulper to prevent scale formation throughout the stock system. Nalco 680, applied at the headbox, has been helpful in securing more uniform sizing, higher, more uniform ash content at lower chemical cost, a higher operating pH and better pH control, improved fibre retention, and elimination of wire deposits.

For the same results in your mill with these, and other Nalco System chemicals and services, call your Nalco Representative or write direct for prompt action and complete information.

WRITE FOR THIS BULLETIN

Free upon your request

Nalco Bulletin 55 gives data on all Nalco System products and services for the paper industry. Your copy will be sent, without obligation, upon your request. Ask for Bulletin 55 today.

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The Paper Industry

Technology • Engineering • Management • Production

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The PAPER INDUSTRY is indexed regularly in **Engineering Index** and **Industrial Arts Index.** An index to each volume is issued annually by the publisher as a part of the April number.

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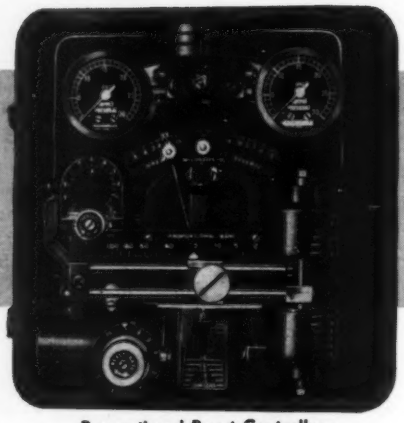
NEW MASONEILAN 12000 SERIES

Offer Accurate, Sensitive,

New Ease of Selection;

Proportional Controller



Proportional-Reset Controller

These new controllers reflect a realistic blending of past experience and current design trends, combining advanced features which reduce weight, improve adjustability and increase ease of selection, installation and servicing.

Consider what these design improvements can mean to you . . .

UNIT CONSTRUCTION

Unit subassemblies of the control mechanisms (proportional, or proportional-reset, unit and level setting mechanism) are mounted on the mechanism bracket which is in turn rigidly attached, piloted and doweled to the torque tube housing. Thus, individual units are fixed in position, unaffected by possible distortion of the case, yet are readily removable for servicing or interchange. Other sub-assemblies (pilot and manifold) are mounted in the rugged aluminum case which is finished and gasketed for outdoor service. Cover is closed by a positive cam-type latch.

SIMPLE AIR CIRCUITS

The high-capacity, balanced, amplifying, pilot with frictionless floating-action valve and cleanable sapphire orifice, is connected to the forged brass manifold which contains most air passages. Tubing in the proportional controller is limited to two short lines. The nozzle is easily removable for cleaning, and after replacement requires no aligning. Special ring type adapters facilitate connections.

EASE OF ADJUSTMENT

Proportional band setting . . . is made on a rod-type cantilever spring by a self-aligning clamp tightened by a large knurled knob located in front of the mechanism. A four-inch direct reading scale indicates the setting.

Control action and specific gravity setting . . . are selected by attaching the control link to desired side of reversing arc along the specific gravity scale, graduated from 0.5 to 1.4. The arc is easily reversible when instrument mounting is changed to opposite side of displacer.

Set point . . . is precisely adjustable throughout entire range by turning setting knob over 270° arc scale, 2" long. Scale is reversible when control action is changed.

Direct level indication . . . is provided by a sturdy pointer fastened directly to the torque tube rod. The scale is graduated for both left and right hand instrument mounting and for several specific gravities.

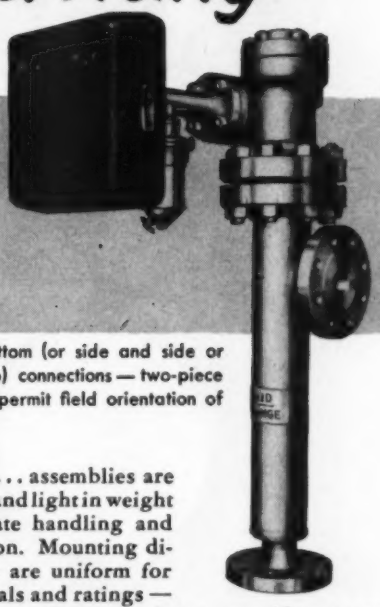
FOR A WIDE VARIETY OF APPLICATIONS

LIQUID LEVEL CONTROLLERS . . .

Dependable Control – plus

Adjustment and Servicing

Top and bottom connections — integral chamber



Side and bottom (or side and side or side and top) connections — two-piece chamber (to permit field orientation of instrument)

Alignment micrometer . . . is sturdily mounted, is readily accessible and permits adjustments with minimum disturbance.

VERSATILITY

The proportional controller . . . may be used as a *Transmitter* and can be converted in the field to a

Differential gap controller . . . by simply reversing position of the coil spring and bellows in the proportional unit; or

Proportional-reset controller . . . by interchanging the proportional unit and the proportional-reset unit.

STURDY, COMPACT, ACCURATE MEASURING UNIT

All parts of the *Torque Tube Assembly* are made of a single alloy, individual parts being welded to form an integral unit. Knife-edge bearings support both ends of torque tube. Torque tube housing is removable from mechanism chamber.

Stainless . . . steel tubing *Displacers* designed so that standard control mechanism can be used for all ranges, are attached to the torque arm by hangers with modified-knife-edge hooks. Hanger extensions may be integral or detachable.

Chamber . . . assemblies are compact and light in weight to facilitate handling and installation. Mounting dimensions are uniform for all materials and ratings — and are in whole numbers; on side-mounted types mounting dimensions equal level range.

VARIETY OF TYPES, MOUNTINGS, MATERIALS

Instrument Types include *Proportional, Proportional-reset, Differential Gap Controllers* and *Transmitters;* or any combination of two of these in larger case. *Mounting Types* include top and bottom, side and side or side and either top or bottom, with screwed or flanged connections; also top or side of vessel with flanged connections. Instrument mounting left or right of displacer.

Ratings up to 2500 lbs. ASA.

Materials include iron (14″ & 32″ only), steel or alloy chambers; stainless steel displacers; inconel (or wide selection of other materials) torque tube assemblies.

Ranges — 14″, 32″, 48″, 60″, 72″, 84″, 96″, 120″

Complete details sent on request. Address

ALL HIGH Quality Control PRODUCTS

MASON-NEILAN REGULATOR CO.

1187 ADAMS STREET, BOSTON 24, MASS., U. S. A.

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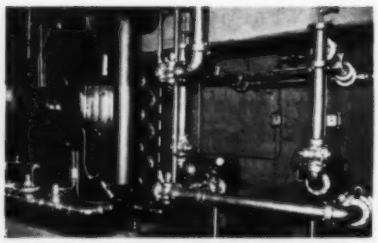
IN THE PULP AND PAPER INDUSTRIES

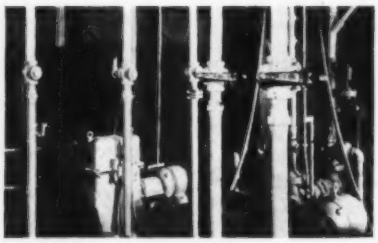
Wedging is impossible

That's just one of the reassuring facts about a.C.f. Full Round Port Cylindrical Plug Valves. The second is simply that you're always assured 100% unobstructed flow at all times.

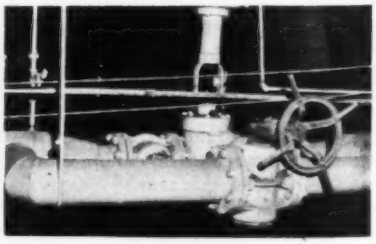
Together they mean long years of trouble-free service handling heavy or viscous ladings, solids in suspension, liquids and gases with equal efficiency.
You can be *sure* when you specify a.C.f.!



IN SEWAGE PLANTS the a.C.f. CYLINDRICAL Plug shears obstructions . . . provides uninterrupted flow on sludge lines.



IN INDUSTRIAL PROCESSING a.C.f. Valves handle materials in suspension, here it's clay slip, with no erosion problems.



IN STEEL PLANTS on natural gas lines to open hearths, the full pipe area and non-wedging features mean full flow, fast shut-off.

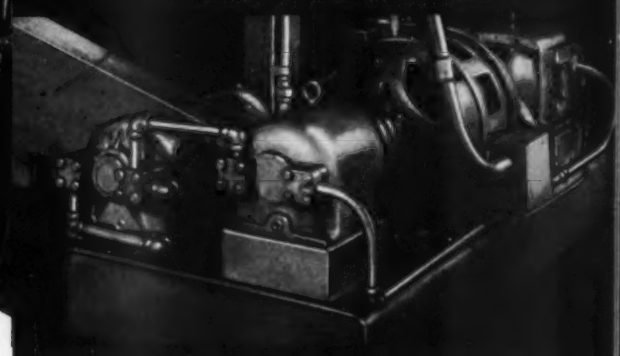
a.C.f. CYLINDRICAL FULL PIPE AREA **PLUG VALVES**

Write for Catalog 4-Pl. American Car and Foundry Company, Valve Division, 1501 E. Ferry Ave., Detroit 11, Michigan.

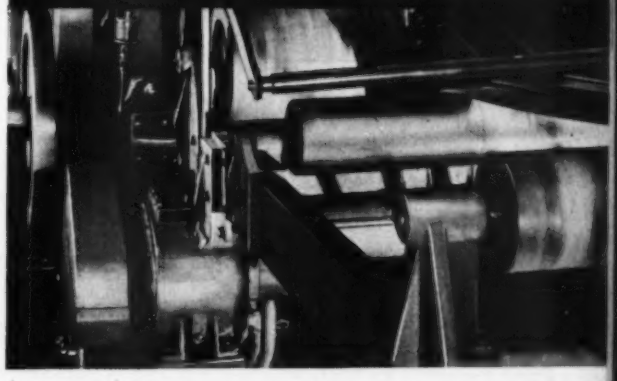
Representatives in 50 Principal Cities

Saves Time, Money, Material

ON CHICAGO CARTON COMPANY
LAMINATING MACHINE



AND CUT-OFF



Oilgear drive installed in 1934 operates 16 hours daily at low cost. Gives maximum production on all stocks with little spoilage or non-productive time

A laminating machine and a cut-off in the plant of the Chicago Carton Company are driven in synchronism by Oilgear Fluid Power Equipment installed in 1934. A trip to the plant reveals today the compact, sturdy Oilgear equipment on the lower floor performing quietly, efficiently and continuously 16 hours a day in the necessarily humid atmosphere. Maintenance records indicate a total expenditure of $93.21 during the 16 years for service and parts, less than $6.00 a year. Because of the full flexible speed range and easy controllability of the Oilgear drives, the laminating machine is operated at speeds that best fit the type of board being processed and the cut-off drive follows in synchronism to cut stock into uniform lengths.

Another Oilgear feature important here is the unusual speed with which the laminating machine drive and cut-off drive can be started and stopped. This feature of Oilgear smooth, high speed acceleration and quick hydro-dynamic braking reduces non-productive time and cuts spoilage of sheets to a bare minimum.

On the basis of the 16 year performance of Oilgear, the Chicago Carton Company recently installed another Oilgear drive on a new 125 hp installation.

Time after time, Oilgear demonstrates its superiority and dependability on variable speed drives. Oilgear Fluid Power has many advantages. Investigate them now. THE OILGEAR COMPANY, W. Pierce St., Milwaukee 4, Wis.

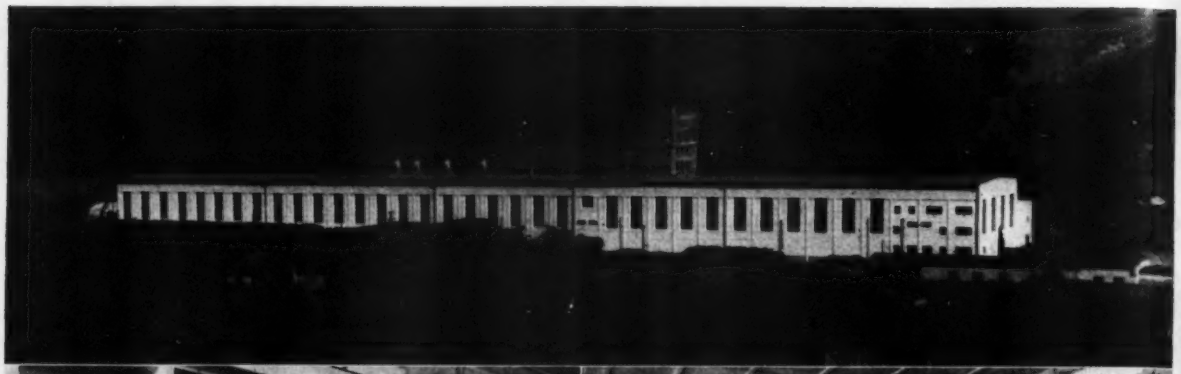
UPPER—Oilgear 40 hp Variable Speed Drive with electric pilot motor remote control and oil reservoir base.

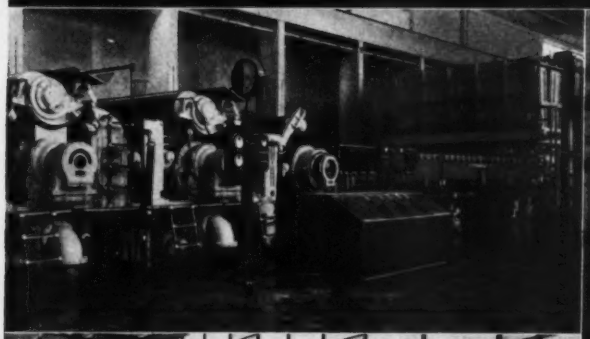
LOWER—Oilgear 7½ hp Variable Speed Drive with automatic control to synchronize cutter speed with speed of laminating machine drive.

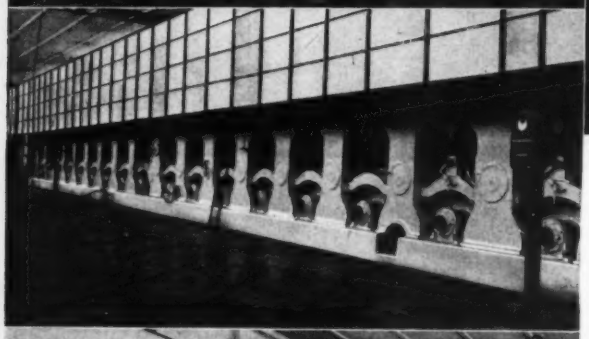
Oilgear

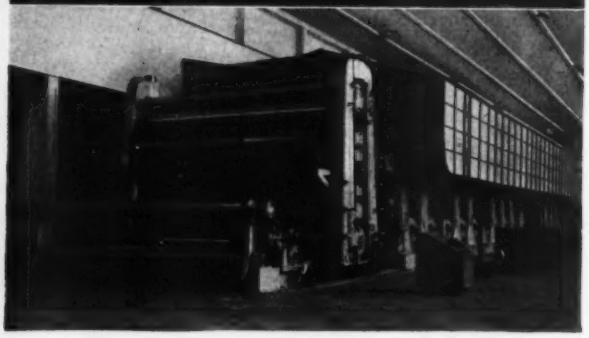
PIONEERS IN FLUID POWER

PUMPS, TRANSMISSIONS, CYLINDERS AND VALVES









This is the most recent of Bagley & Sewall productions, designed, built and installed for the Murztaler Holzstoff-und-Papier-Fabriks A. G. in the city of Bruck/Mur, Austria, one of Europe's finest and most modern paper mills.

This fourdrinier machine has a wire width of 226 inches and length of 100 feet. Outstanding in design features, from the remote control system to the many engineering innovations throughout the various machine sections, it is one of the most modern papermaking machines in the world, today. Another B & S paper machine designed for efficient and economical manufacture of paper.

International recognition and acceptance of Bagley & Sewall resourceful engineering and precision built papermaking machinery is evidenced by the many installations in leading mills throughout the world.

100TH ANNIVERSARY 1853 1953

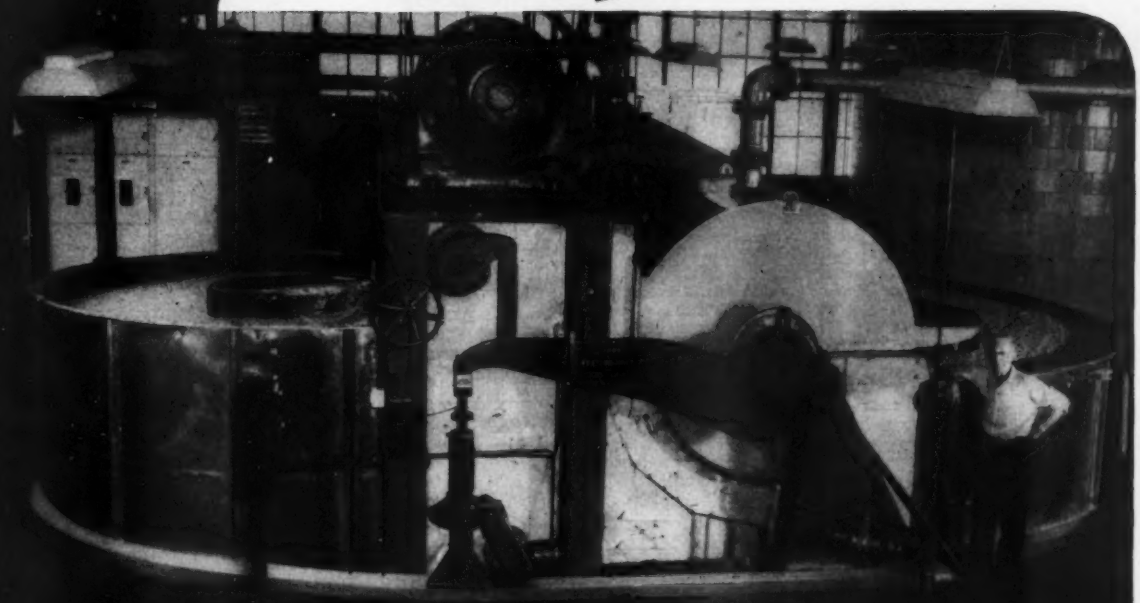
designing and building paper making machinery

BAGLEY & SEWALL

WATERTOWN • NEW YORK

Foreign Representative • CASTLE AND OVERTON, Inc., 630 Fifth Avenue, New York 20, N.Y.

ANOTHER E.D. Jones INSTALLATION



Improved paper formation; 50% saving in horsepower

Results count! And the results on this *Jones Beating Unit*, installed last year at the Taylor Fibre Company, Norristown, Pa., are reported by their Paper Mill Superintendent, C. L. Horst.

"We are able to beat off stock of all grades in the new unit in one half the time it takes to achieve the same results in the old beater . . . a saving in horsepower of 50% per ton of stock.

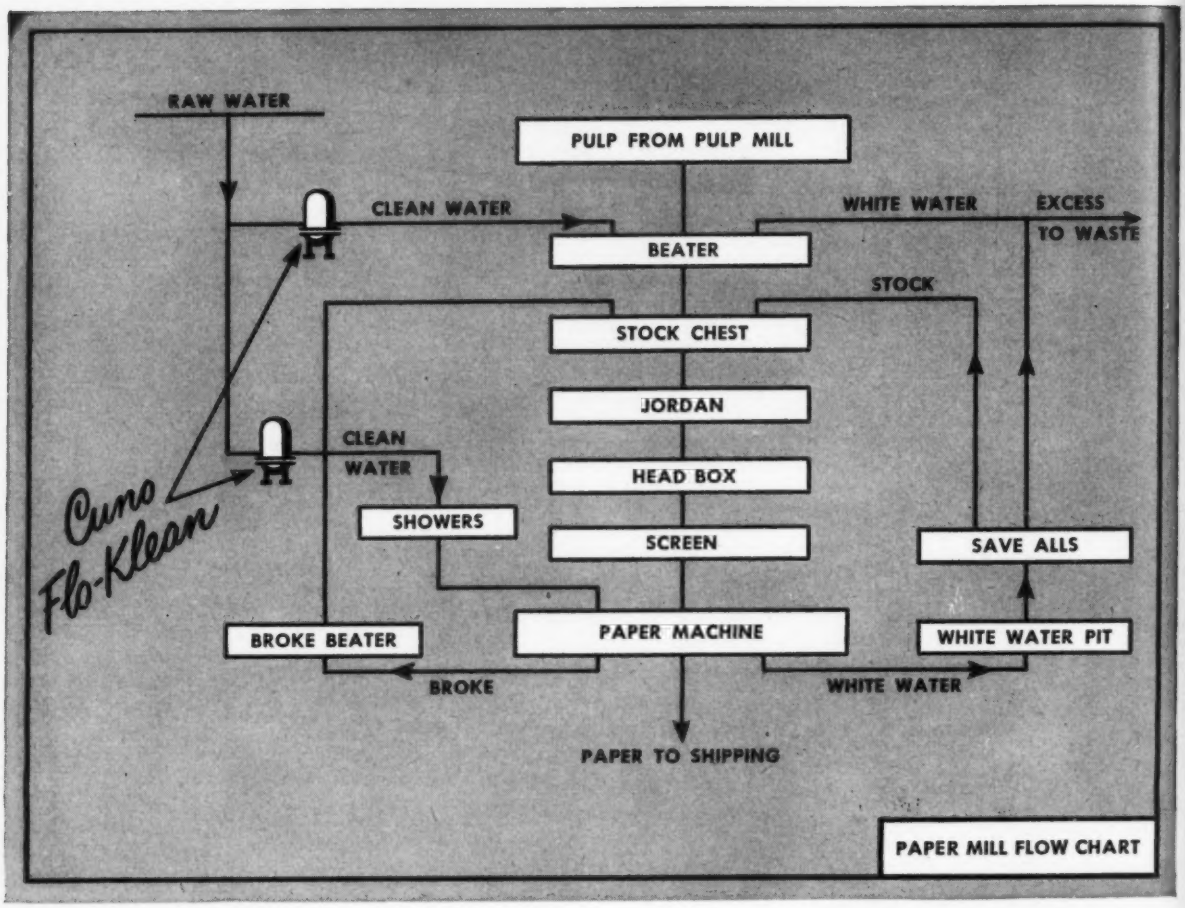
"As to the cutting action, the actual fibre length is much more uniform, which has had the effect of improved paper formation".

Remarkably simple to install — because it is delivered completely *pre-assembled* — the Jones Beating Unit is available for either tub or Multi-Beater applications. For details, ask your Jones representative, or write us direct.

E.D. Jones

E. D. JONES & SONS COMPANY
PITTSFIELD, MASS.

REPARATION MACHINERY



Plan for longer uninterrupted production

When paper and pulp mills have clogged showers or damaged wet felts and Fourdrinier wires, it takes time and money to get going again.

Paper and pulp men have learned from experience that they can avoid costly down-time by installing Cuno FLO-KLEAN filters in their water systems. FLO-KLEAN filters remove harmful solids from river, lake or well water before equipment can be damaged.

You can install a FLO-KLEAN and forget about down-time caused by dirty water. Automatic and continuously self-cleaning, FLO-KLEAN filters are available to handle between 200 and 100,000 gallons of water per minute—with no interruption of flow, and no loss of backwash water. Pressure loss is negligible in this corrosion- and abrasion-resistant unit.

To find out how FLO-KLEAN can protect your equipment and save money write for free FLO-KLEAN bulletin to the Cuno Engineering Corporation, Dept. 393F, Meriden, Conn. F.3.3

CUNO

ENGINEERED FILTRATION

Removes More Sizes of Solids From More Kinds of Fluids

AUTO-KLEAN (disc-type) • MICRO-KLEAN (fibre cartridge) • FLO-KLEAN (wire-wound)

Better Valves–Year After Year

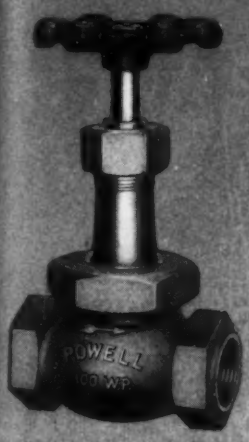


Fig. 1878—Aluminum Globe Valve for 300 pounds W.P. Has union bonnet, stainless steel stem and composition disc. Also available with flanged ends.

Because for more than a hundred years Powell Engineers have never been willing to "let well enough alone," the Powell Line has been continually improved and expanded to satisfy every new demand of Industry.

That's why you'll find a greater variety of Powell Valves in service today than of any other individual make.

The Wm. Powell Company
Cincinnati 22, Ohio

Fig. 2342—Stainless Steel Swing Check Valve for 150 pounds W.P. at 500F. Also made for 300 and 600 pounds W.P. at 800F. Available in other corrosion-resisting metals and alloys. Also furnished with screwed ends.

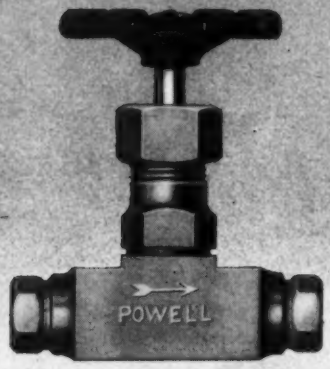


Fig. 1976-K — Powell Stainless Steel Koncentrik fitted Needle Globe Valve for 3000 pounds W.O.G. Especially adapted for instrument lines. Simplifies tubing installations and provides positive leak-proof connections without threading, welding or soldering. Gate, Globe, Check and "Y" Valves also available. Made in sizes for tubing up to and including 1" O.D. Also made in other corrosion-resisting metals and alloys. WRITE FOR ILLUSTRATED CIRCULAR.

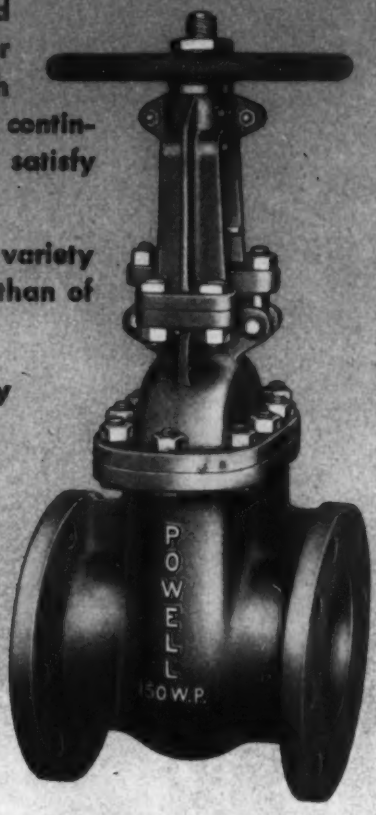
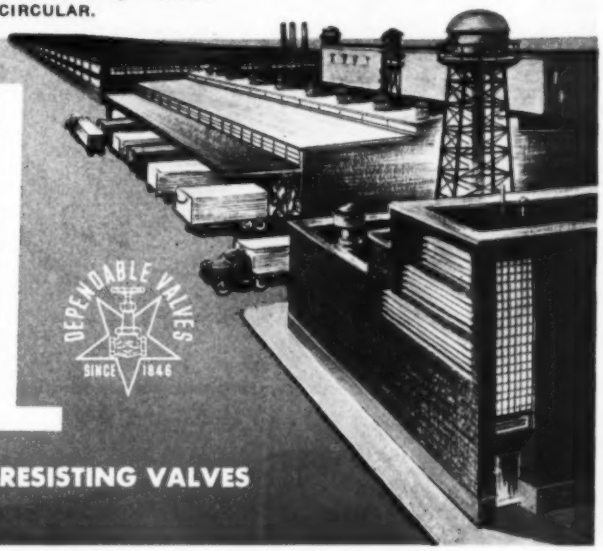


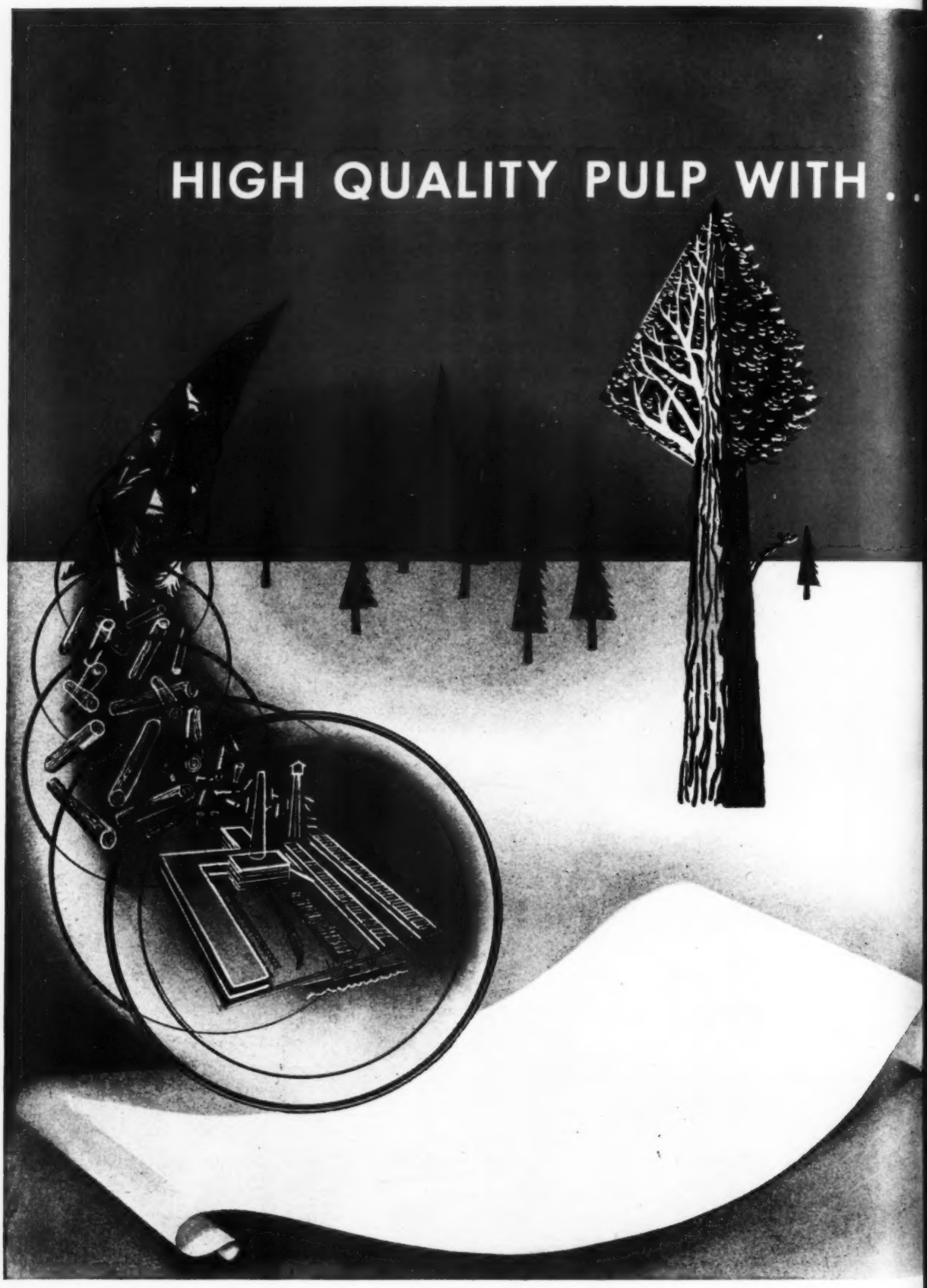
Fig. 2453-G—Large 150-pound Stainless Steel O. S. & Y. Gate Valve. Precision-fitted, accurately guided, interchangeable solid or split wedge. Separable yoke arms in sizes 5" to 30", inclusive. Conforms to all the latest standards. Can be furnished in any metal or alloy needed to resist corrosion in Paper Mill services.

POWELL

DEPENDABLE VALVES SINCE 1846



BRONZE, IRON, STEEL AND CORROSION RESISTING VALVES


HIGH QUALITY PULP WITH . .

. . SUTHERLAND HIGH YIELD SULPHATE PROCESS

WHAT IT IS

A revolutionary new method for the production of high quality kraft pulp at yields considerably above any possible in conventional kraft production.

HOW IT WORKS

A high yield pulp is first obtained by heating pieces of wood in an alkaline cooking liquor under limited conditions of temperature, time and alkali concentration such that a pulp is formed consisting of a high percentage of fiber bundles which are not substantially separated. This limited cook is blown from the digester to a blow tank where it is diluted to refining consistency by addition of hot alkaline wash liquor. The diluted pulp suspension is then refined while hot and the refined pulp is washed. The hot alkaline wash liquor is recovered for use in the dilution step.

RESULTS

Mills using this process have reported a 15 to 20% increase in yield over normal operation, and substantial reduction in operating costs as a result of savings in wood. In addition to substantially increased profits, the new process marks a major step forward in wood conservation.

APPLICATIONS

The Sutherland High Yield Process is being used for the production of high yield linerboard and will, in the near future, be applied to other unbleached grades. Bleaching of high yield pulps is a possibility and does result in a marked increase in yield, although at the present cost of wood and chemicals, it does not offer the savings possible in unbleached grades. The use of this system for bleached pulps will follow a natural development course in the foreseeable future.

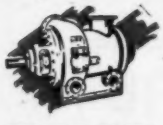
PATENT

U. S. Patent No. 2,591,106, dated April 1, 1952, has been issued covering this process. While this patent in no way limits the user of the process in his choice of equipment, it does limit the use of the process to licensees of the Sutherland Refiner Corporation. Licenses are available to qualified mills on application to Sutherland Refiner Corporation.

HIGH YIELD SYSTEMS

SUTHERLAND REFINER CORPORATION

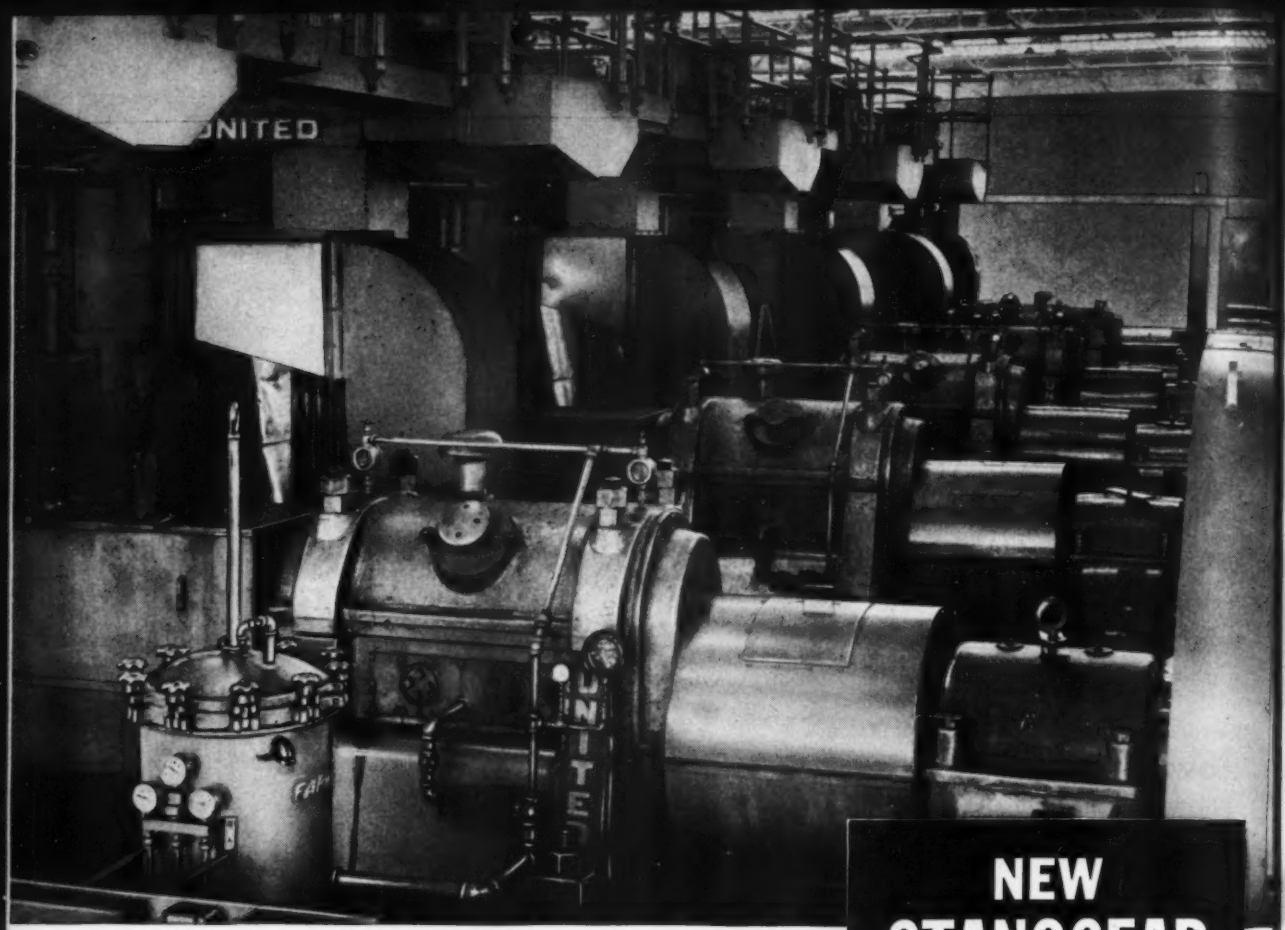
TRENTON 8, NEW JERSEY



BREAKER TRAPS

PRESSURE WASHING

MANUFACTURED BY—
VALLEY IRON WORKS CO., APPLETON, WISCONSIN



NEW STANOGEAR
REG. U. S. PAT. OFF.
Compounds

NOW . . . 7 ways better for extreme-pressure lubrication . . .

New and improved STANOGEAR Compounds have been developed to meet the requirements of an increasing variety of tougher extreme-pressure lubricating jobs found throughout industry, today. The result of several years of special research and field test work, these outstanding products have proved in actual service their ability to provide these important advantages:

1. Higher load carrying capacity. Use of improved extreme-pressure additives in STANOGEAR Compounds provide a greater anti-weld property. This results in the higher load carrying capacity which these products have demonstrated in actual service.

2. Superior retention of load carrying capacity. In service tests, STANOGEAR Compounds have proved superior to conventional extreme-pressure lubricants in ability to maintain a high load carrying capacity over extended periods of service.

3. Freedom from objectionable deposits. Appropriate base stocks and additives give STANOGEAR Compounds a high resistance to oxidation, thus minimize the formation of deposits.

4. Excellent storage stability. STANOGEAR Compounds contain compounding ingredients which assure excellent stability both in service and storage.

5. Good water separation. STANOGEAR Compounds have demonstrated their superiority to ordinary extreme-pressure lubricants in ability to provide good water separation.

6. Anti-foaming. Under adverse operating conditions, the anti-foam agent in STANOGEAR Compounds has prevented foaming troubles.

7. Versatility. A unique combination of additives in STANOGEAR Compounds equips these products for various industrial gear applications where extreme-pressure lubricating properties are necessary. To meet varying viscosity requirements, STANOGEAR Compounds are available in eight viscosity grades.

The Standard lubrication specialist in your area of the Midwest will be glad to give you more information about the new STANOGEAR Compounds. You need only phone your local Standard Oil office. Or write: Standard Oil Co., 910 South Michigan Avenue, Chicago 80, Illinois

STANDARD OIL COMPANY STANDARD *(Indiana)*

BECCO® BRIEFS

HIGH DENSITY PULP BLEACHING

Continuous hydrogen peroxide bleaching at 25-40% density is increasingly used for groundwood and chemical pulps in crumb or sheet form. High density operation has reduced chemical cost and floor area requirements. Groundwood bleaching is now more efficient than ever. Chemical and semi-chemical pulps are super-bleached to high brightness with improved aging characteristics not otherwise attainable. For detailed information write for Becco Bulletin No. 48.

Buffalo Electro-Chemical Company, Inc.

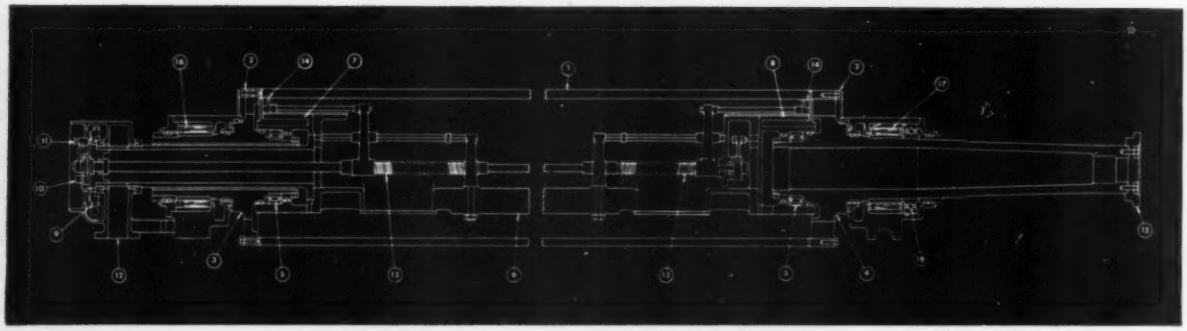
DIVISION OF FOOD MACHINERY AND CHEMICAL CORPORATION

fmc

Sales Agent: BECCO SALES CORPORATION, Station B, Buffalo 7, N.Y.
Buffalo • Boston • Charlotte • Chicago
New York • Philadelphia • Vancouver, Wash.

THE KEY TO EFFICIENT WATER REMOVAL ON FOURDRINIERS

Downingtown Suction Cantilever Couch Rolls



1. Spiral Drilled Shell
2. Alloy Steel Shell Studs
3. Front Head
4. Rear Head
5. Internal Roller Bearings
6. Suction Box
7. Front Head—Suction Box
8. Rear Head—Suction Box
9. Worm Wheel Gear
10. Front and Rear Deckle Gears
11. Packing Strip Adjustment
12. Suction Elbow
13. Front and Rear Deckle Screws
14. Deckle Heads
15. Coupling to Drive
16. Front Main Bearing
17. Rear Main Bearing
18. Thrust Bearing

Downingtown Suction Cantilever Couch Roll showing adjusting mechanism and hood guard.

Because of Downingtown's long experience with the principle of water removal by the suction method, their Suction Cantilever Couch Roll is recognized as "standard" in the paper industry. The cantilevering feature is important because it permits easier and faster wire changing.

Downingtown Suction Cantilever Couch Rolls are furnished with suction connections either front or rear . . . and with single or multiple suction box openings. The experience of many mills shows that these Suction Cantilever Couch Rolls give long and efficient service and require a minimum of maintenance.

Write for a new bulletin "Suction Couch Rolls" which describes Downingtown Suction Cantilever Couch Rolls in detail.

DOWNINGTOWN MANUFACTURING CO.
DOWNINGTOWN, PA.

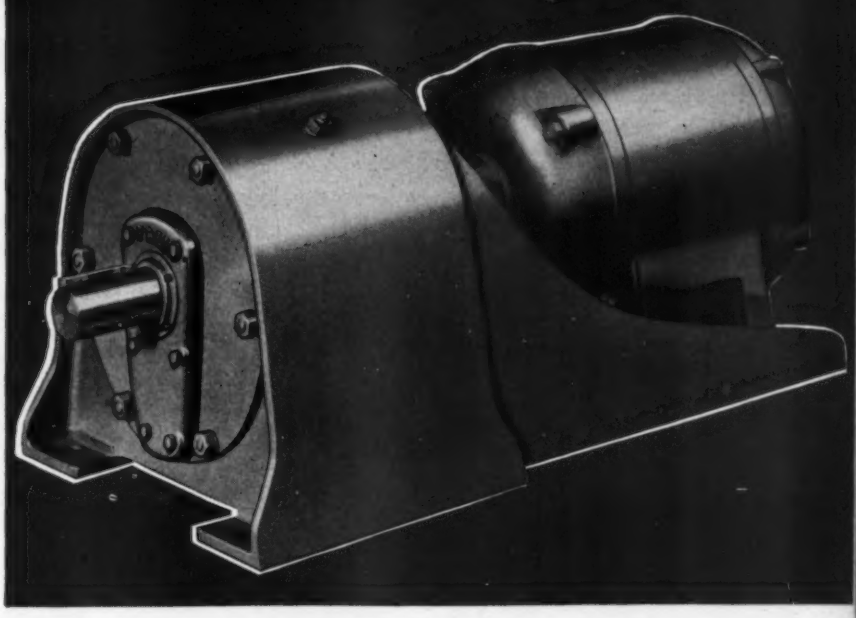
West Coast Representative:
John V. Roslund
Pacific Bldg.
Portland, Oregon.

DOWNINGTOWN
DESIGNERS AND BUILDERS OF PAPER, BOARD AND FELT MACHINES SINCE 1880
MODERNIZATION IS PROFITABLE

With the All-Motor Type,

ALL-STEEL FALK Motoreducer

you can interchange motors in minutes... *on the job!*

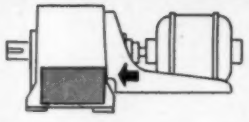


Fast, easy maintenance gives savings in time and money

With the *all-steel*, All-Motor type FALK Motoreducer . . . the only complete and compact motorized reducer with a separately mounted, resilient Steelflex coupling-connected motor . . . you can replace or interchange motors, *or even parts*, in minutes—*on the job*, without long and costly "down time"! Ratios can be changed (within capacity) without motor modification.

Any make, speed, or type of standard foot-mounted motor within the unit's AGMA rating is usable *without modification* on this All-Motor type Motoreducer. Motors with variable speed drive arrangement can be used, if desired. No "partial" motor or special shaft is required in event of motor replacement—simply use a complete motor, available for quick delivery from factory or local stocks without expensive delays.

Add to these exclusive maintenance-saving advantages the FALK "In-built" Factors, described at the right, and you have an unbeatable combination of quality, application adaptability, dependability, long-range economy, and dollar-for-dollar value. Write for Bulletin 3104.



Every FALK Motoreducer has these "In-built" Factors—

Positive Lubrication. Large sump capacity . . . oil-tight construction assures clean lubricant . . . direct dip of revolving elements provides positive lubrication at all speeds.

Wide Speed Range. Selective ratio combinations provide output speeds from 1.5 rpm to 1430 rpm with stock gears.

Streamlined Inside and Outside. Smooth, clean surfaces; machine welded construction conforms to NEMA motor frames.

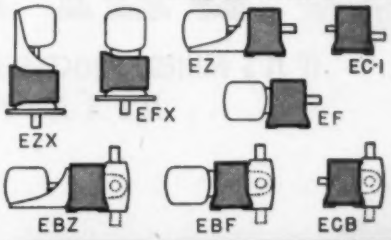
Sealed Housings. Dual closures and one-way vents keep oil *in*, dust and moisture *out*. Units are splash-proof, leakproof, dustproof.

Precision Gearing. Heat treated alloy steel, precision cut and shaved helical gearing throughout . . . quiet-operating crown shaved pinions . . . taper bored gears for easy ratio changes.

All-steel Housings. Unbreakable, strong, rigid. Generous overhung load capacities provided by wide bearing spans, large shafts and bearings.

EC

The basic E design permits maximum use of standardized parts . . . closer control over materials, processing, inspection and assembly . . . resulting in faster delivery from interchangeable stocked assemblies.



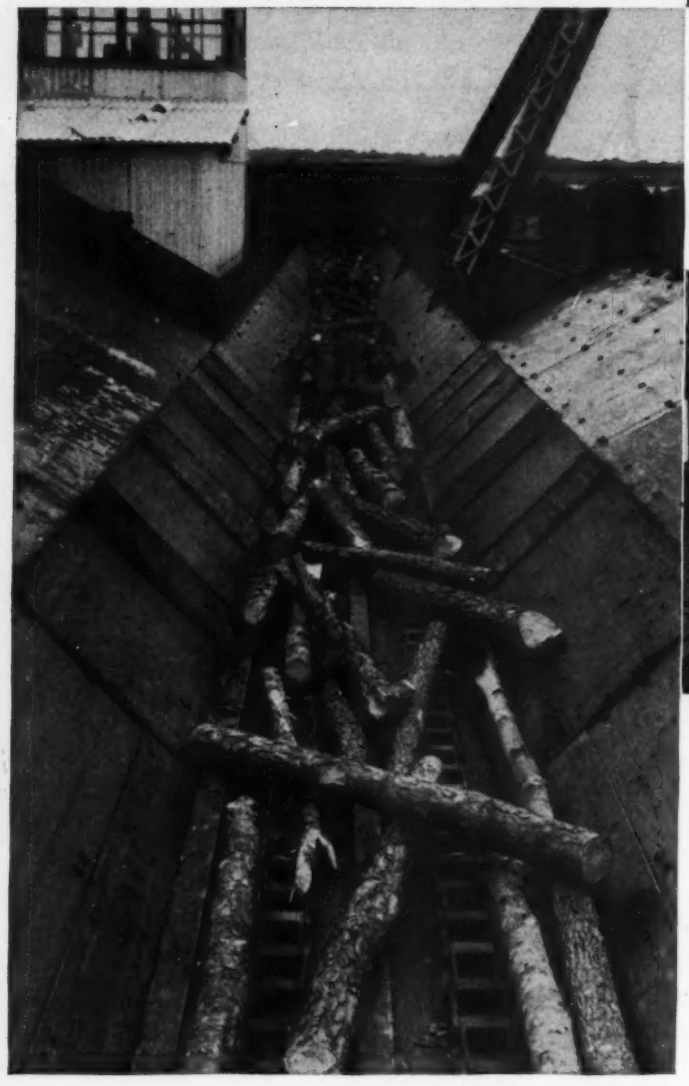
FALK ...a good name in industry

THE FALK CORPORATION · 3001 W. Canal St. · Milwaukee 8, Wis.

WRITE FOR BULLETIN 3104

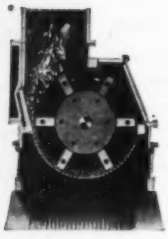
PAPER IS ESSENTIAL

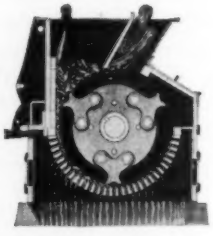
without it we wouldn't be writing to tell you that . .



Jeffrey builds quite a lot of equipment used in paper making. We begin with pulpwood handling and follow through each step of the process to the finished paper rolls (see list below). Many companies are cutting costs, speeding production and otherwise running more smoothly because of Jeffrey equipment. We can help you . . . write us today.

A Jeffrey Belt Conveyor handling chips (above). Chain Conveyor handling pulpwood at the left.





Crushers, pulverizers and shredders for reducing wood, chips, salt cake, pulp lap, etc.

Belt Conveyors **Chain Conveyors** **Log Haul-ups** **Crushers**
Unloaders (Barge) **Re-chippers** **Grinders** **Bucket Elevators**
Chemical Feeders **Transmission Machinery** **Spiral Conveyors**

THE JEFFREY MANUFACTURING CO.

ESTABLISHED 1877

Columbus 16, Ohio

sales offices and distributors in principal cities

PLANTS IN CANADA, ENGLAND, SOUTH AFRICA

IF IT'S MINED, PROCESSED OR MOVED
. . .IT'S A JOB FOR JEFFREY!

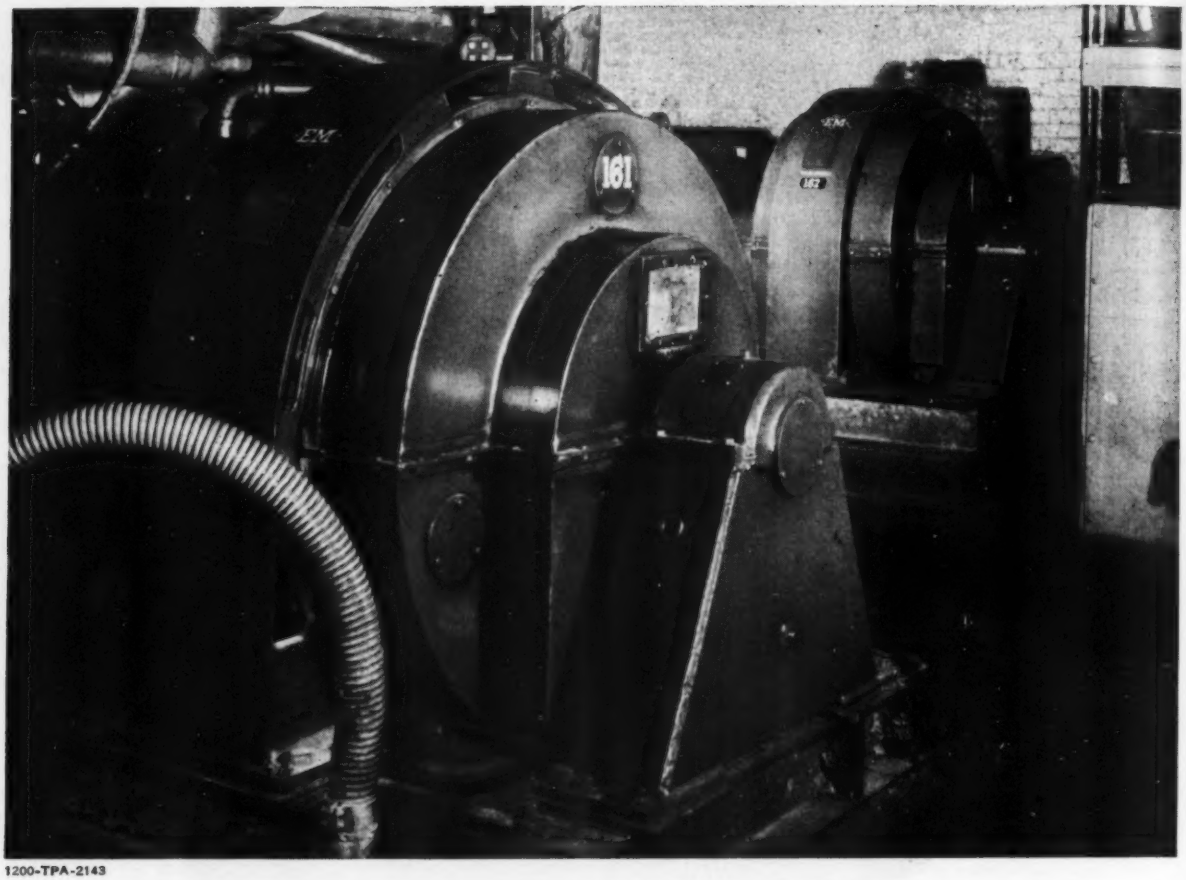
Too Big a Bite

Approximately 11% of the annual forest removal is caused by *drain* . . . the wood destroyed by fire, insects and disease. This is non-recoverable loss and is proving to be largely avoidable under today's modern forest management.

On the brighter side of the picture, is the fact that in the federal government's four forest appraisals made since 1909, the ratio between annual growth and loss by fire, insects and disease has decreased from 28.8% to 11%. Any further lowering of this drain factor will mean that timber growth will more than equal total removal.

Weyerhaeuser foresters, pioneers in tree farming, have established that successful operation of a tree farm depends first upon a fire protection system sufficiently effective to hold annual fire losses below an established maximum. In the case of Weyerhaeuser West Coast tree farms this allowable loss is ¼ of 1% of the acreage . . . as compared to 3.4% nation-wide average.

This is just one facet of the Weyerhaeuser forestry policy which is designed to insure a continuing supply of pulpwood for the Weyerhaeuser sulphite and sulphate pulp mills.



1200-TPA-2143

"Never have any trouble with 'em..."

This is J. J. Bechard of Flintkote, inspecting the control for one of his E-M Synchronous Motors. The E-M Polarized Field Frequency Relay is utilized for smooth, powerful synchronizing.

. . . so says J. J. Bechard, engineer at the Pioneer Division of the Flintkote Company in Los Angeles, California.

He's talking about the E-M Synchronous Motors in his care. Shown above are two 200 hp, 428 rpm E-M Synchronous Motors driving Jordans at Flintkote.

Among the reasons why E-M Synchronous Motors earn such praise is the special engineering and manufacturing care given to components such as coils and bearings. For example, coils have the finest insulating materials available and are treated for maximum moisture protection. Heavy coil-end lashing prevents distortion on full-voltage starting. You can expect this same extra value construction, feature by feature, in every E-M Synchronous Motor you buy.

All in all, these Motors offer many important advantages to your mill drive system . . . *high efficiency*, which saves on power costs . . . *power factor correction*, through ability to supply leading reactive kva . . . adaptability for *direct connection* . . . and others.

E-M also provides a full-line of special enclosures for maximum protection and continuous operation under difficult conditions. To see what selection of features will prove best for your mill drive, see your nearest E-M sales engineer. And you'll be interested in *E-M Synchronizer* No. 26, the pulp and paper mill number, which illustrates many important applications of synchronous motors. Write for your free copy.

ELECTRIC MACHINERY MFG. COMPANY

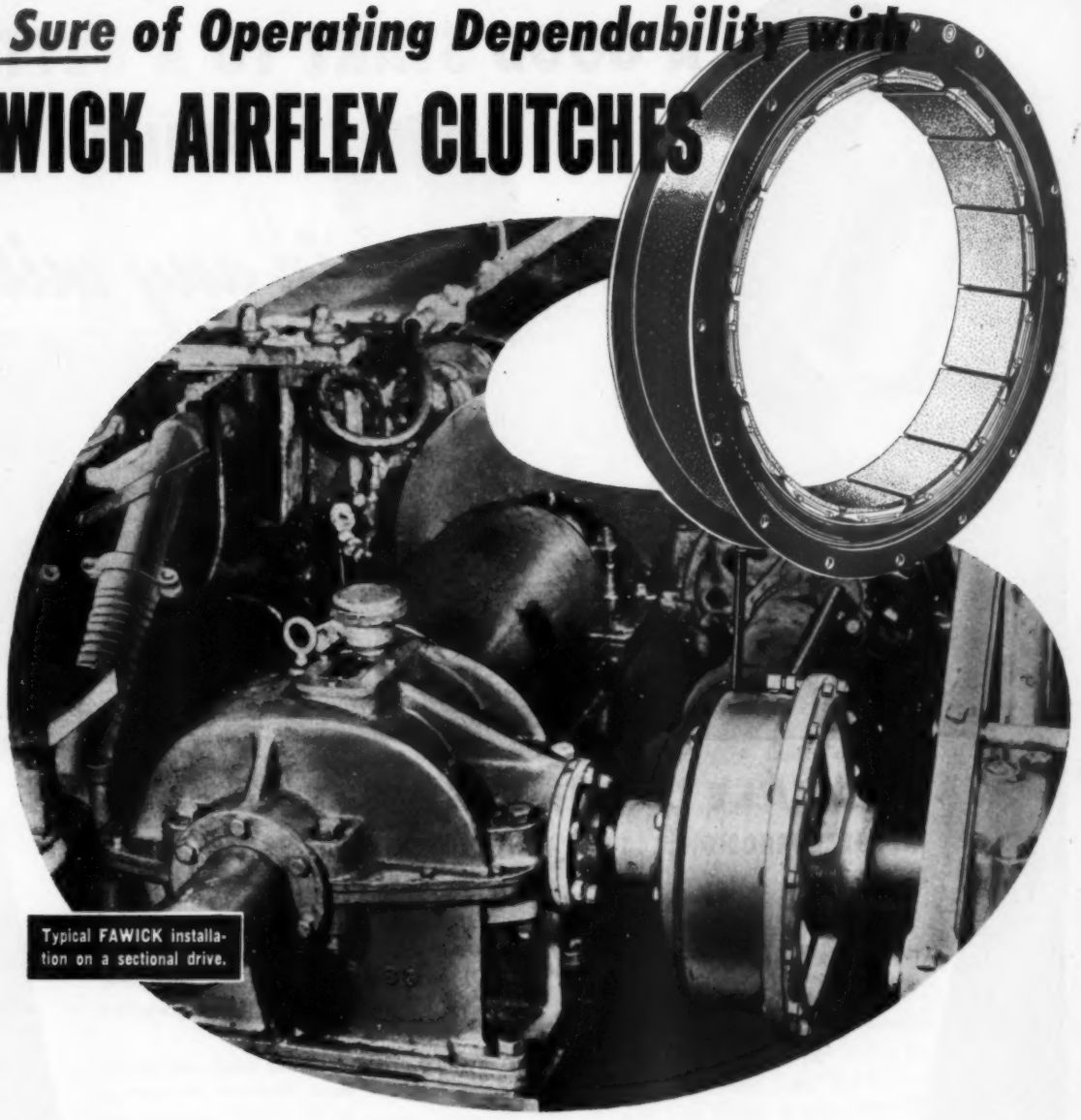
MINNEAPOLIS 13, MINNESOTA

Specialists in making motors do

EXACTLY WHAT YOU WANT THEM TO

Be Sure of Operating Dependability with

FAWICK AIRFLEX CLUTCHES



Typical FAWICK installation on a sectional drive.

Be Sure of long, trouble-free clutch operating life—assured by cooler running, fully ventilated FAWICK AIRFLEX CLUTCHES.

Be Sure of smooth operation through shock-absorbing FAWICK CLUTCHES. The shock-absorbing flexibility of the torque-transmitting cord and rubber tube, plus 360° constant velocity contact with the friction surface provide unmatched smoothness and dependable clutch action.

Be Sure of continued "new clutch" action made possible by FAWICK automatic adjustment which compensates for operating wear.

Be Sure of unparalleled low maintenance costs—FAWICK units require no lubrication or adjustment of operating linkage.

These and many other exclusive FAWICK advantages will insure more efficient operation of your sectional drives and other machines—They add up to the BEST for your equipment—FAWICK AIRFLEX CLUTCHES.

FAWICK AIRFLEX DIVISION
FEDERAL FAWICK CORPORATION
9919 CLINTON ROAD • CLEVELAND 11, OHIO

For further information on Fawick Industrial Clutch and Brake Units, write to the Main Office, Cleveland O., for Bulletin 400-A.

FAWICK Airflex

INDUSTRIAL CLUTCHES AND BRAKES

A GOOD START TO A BETTER FINISH... *in any mill*

MIDVALE STAINLESS STEEL ROLLS

RESIST CORROSION... LAST LONGER... REQUIRE FEWER REGRINDS

Skill in machining . . . precision in finishing . . . careful inspection by Midvale craftsmen assure paper mill rolls with a higher lustre and longer life.

Every day the reliability of Midvale stainless steel rolls is being proved in America's leading paper mills. Midvale's skilled craftsmen, modern equipment and quality control—from furnace to finished roll—offer you rolls with unsurpassed performance built in them.

Whatever your needs in rolls—either stainless or alloy for fine paper, corrugated or other material—Midvale can make the rolls you need. Midvale produces all types of heavy equipment to meet the specifications of the paper industry—steel forgings, heat and corrosion resistant castings.

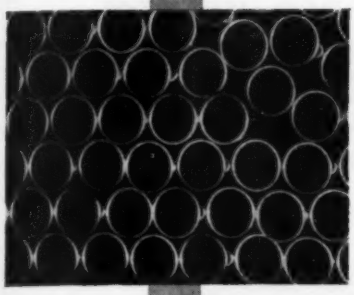
THE MIDVALE COMPANY
NICETOWN, PHILADELPHIA 40, PA.
OFFICES: NEW YORK • CHICAGO • PITTSBURGH
WASHINGTON • CLEVELAND • SAN FRANCISCO

MIDVALE

Custom Steel Makers to Industry

PRODUCERS OF FORGINGS, ROLLS, RINGS, CORROSION AND HEAT RESISTING CASTINGS

What Proves the Worth of a Boiler Tube?



Claims of dependability . . . of consistently uniform wall thickness, diameter, and physical properties . . . of freedom from scale, slivers, pitting, and other defects inside and outside a tube, are common—*and true*—for all quality boiler tubes regardless of the mill that supplies them. They are true because *all boiler tubes must conform to the same specifications for the same jobs.* Side-by-side they're "look-alikes," yet there is a difference . . . a difference that only *time* can prove under the grueling conditions of heat, pressure, corrosion, and oxidation found inside a modern boiler. B&W boiler tubes have met this test of time in boilers serving the widest variety of applications . . . utilities, industries, government institutions, hospitals, office buildings, apartment houses . . . wherever fine boilers are operating efficiently over extended periods.

Say B&W before you say WELDED BOILER TUBES—for Service-Proved Dependability.

For three-quarters of a century, B&W has been directly concerned with developing and applying boiler tubes for lowest pressures up to those approaching 3000 psi. The application of this extensive knowledge and experience results naturally in the production of finer boiler tubes.

B&W dependability is proved by time and endorsed by hundreds of customers who keep coming back for more . . .

B&W WELDED BOILER TUBES.

B&W SEAMLESS and WELDED TUBES

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

TA-1742 (A)

HANCHETT knife grinders

chipper, barker, hog knives, paper trimmer, doctor blades

massive, smooth running, accurate with fine finishes plus high production

for better, more uniform

wood CHIPS

at lower cost

MODEL AK

EXTRA HEAVY DUTY

MECHANICAL OR HYDRAULIC TRANSMISSION DRIVES

speeds: 10′ to 100′ — 30′ to 150′ and faster
motors: 7½ h.p. to 40 h.p.
weights: 10 tons up to 40 tons
capacity: 84″ to 360″ and longer

MECHANICAL OR HYDRAULIC HEAD CARRIAGE DRIVE. FOR FLAT OR CONCAVE BEVEL GRINDING.

MODEL GK

HEAVY DUTY

FULLY AUTOMATIC TABLE DRIVES HYDRAULIC OR ELECTRICAL

speeds: 10′ to 80′ per minute (faster if required)
capacity: 32″ to 184″
abrasives: segmental or cylinder type grinding wheels

FINEST KNIFE EDGES

HANCHETT GRINDERS

HANCHETT MANUFACTURING COMPANY

World's Largest Manufacturer of Saw Sharpening and Knife Grinding Machinery

The Paper Industry

August, 1953

Quality Output and Direct Consumer Supply

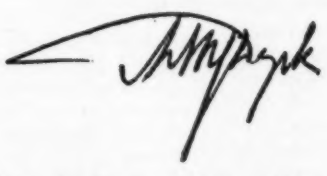
New trends in marketing techniques and product distribution are becoming apparent in the pulp and paper industry. Instead of selling through distributing agencies, more and more paper manufacturing establishments show increasing preference for dealing directly with the consumer.

With rising competition in both the domestic and foreign markets, the paper industry has become increasingly quality-conscious. The main thought underlying production now seems to be "improved quality—irrespective of cost"—and this has led to extensive and expensive plant and equipment modernization programs.

The accent on quality-output is an important factor that has contributed substantially toward the new marketing trend of dealing directly with the consumer. Each long-established and experienced paper manufacturing company has its own exclusive know-how of producing quality goods, and with this know-how is associated a feeling that it is the manufacturing company who is best qualified to explain and sell a quality product to the user. This argument is sound and irrefutable.

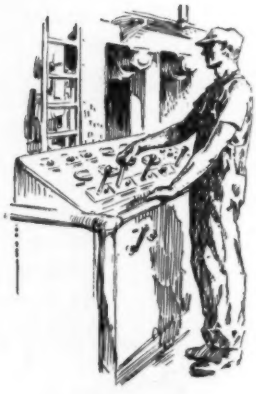
Declining inventories by large consumers of paper and paper products, despite the continuing increase of the overall per-capita paper consumption, is another factor that has contributed to the practice of direct consumer supply. The large paper consumer no longer is overly-anxious to build up large stocks of paper but is inclined to restrict his requirements to immediate needs only. As a direct result, the consumer has become more selective in his purchases, while the paper manufacturer is fully aware of the fact that the time of allocation has come to an end and that, from now on, products will have to be sold.

Should these trends continue—and we are inclined to believe that they will—the successful paper and pulp and paper products manufacturers will have to acquire intimate knowledge of markets, marketing techniques, and market potentials. This will entail setting up qualified market research and merchandising research teams within the company organization. Indeed, there is ample evidence our leading pulp and paper manufacturing companies are becoming exceedingly active in this long-neglected field of endeavor.



PACIFIC NORTHWEST—another in a series of scenes... areas where Appleton Wires serve the paper industry.

THE PACIFIC-NORTHWEST...a backdrop of primitive grandeur brought alive by the power-giving Columbia cascading out to the blue Pacific. Here, too, midst a mingling of backwoods and metropolis, fighting fish, canneries, lumber mills and freshly irrigated agricultural wealth, you'll find the paper industry. And, practically all of these mills already know that *Appleton Wires are Good Wires!*



APPLETON WIRE WORKS, INC., APPLETON, WISCONSIN

The Paper Industry Current Comment

Precarious balance . . . emergency brake . . . and a voice in the wilderness

Congress is being pushed to clear up "must" legislation in time for an August adjournment, but meanwhile the future of American business is on a precarious balance waiting to measure the effects of a Korean truce and the decision of the legislators to continue the excess profits tax in effect until the end of the year.

Despite the strongest efforts of Chairman Reed of the House Ways and Means Committee, Congress has turned down his plan to cancel the tax as of June 30. The Administration now pledges itself to allow the tax to die on December 31, at the same time that a 10 per cent cut in individual income taxes becomes effective. In view of the government budget-balancing efforts, however, and the prospect that there will have to be a boost on the ceiling for the national debt, it may not be wise to bank too much on a cut in the tax structure at the end of the year.

The carry-over of the Truman spending program has applied an emergency brake to the Administration's hopes for quick budget-balancing. Congress is cutting off large chunks from recommendations for appropriations, but whether they will be sufficient to balance the budget this fiscal year remains to be seen.

FTC sincerity

The paper industry will have a chance to measure the sincerity of the Federal Trade Commission's implied promises of saner application of the anti-trust laws in the case of the Blotting Paper Manufacturers Association, which has been cited for violation of the anti-trust laws. The charges will be heard at Richmond September 1, when the industry will have a chance to reply to allegations that six companies and the Association itself have been guilty of unfair methods of competition.

The charges involve trade customs fixing differentials for varying sizes, special packaging colors and the like. The division of the country into zones with differentials to compensate for varying freight rates is also criticized.

It appears that the immediate complaint is the outcome of an investigation initiated several years ago into the workings of various divisions of the paper industry. In recent weeks, newly appointed members of the Federal Trade Commission have criticized the manner in which the Commission under its former membership went far afield in its efforts to convict industries of violation of the anti-trust laws by distorted interpretations of the law. The new commissioners have indicated that without any relaxing of efforts to enforce the letter of the anti-trust laws, business as such would no longer be considered automatically suspect of law violation and guilty until proven innocent.

Washington log-jam

The bills to extend the Reciprocal Trade Agreement Act and the so-called Customs Simplification Act are among those in the present Washington log-jam. The Trade Agreement Act is before a conference committee of the House and Senate, which appears to be unable to reconcile the differences between the House and Senate versions of the bill. The House conferees are insisting on the expansion of the Tariff Commission to seven members, while the Senate conferees are standing on the refusal of the Senate to accept this provision. The Customs Simplification bill has passed the House but is tied up in the Senate Finance Committee where a similar bill was fatally pigeon-holed in the last Congress. Chairman Milliken of the Finance Committee is reported in the newspapers to find the provision for export value unacceptable. In the previous Congress, the paper industry attacked this provision as being one which would encourage the formation of foreign cartels to fix prices for exports to the United States. The paper industry, at that time a voice crying in the wilderness, had little hope of stopping this provision from enactment. In the current Congress, however, other industries helped form a chorus of opposition. It is charged by the opponents of this provision that it was smuggled into a measure to correct manifest complexities of customs law as a means of opening the doors to foreign competition to an extent far wider than would be accomplished by any modification of actual tariff rates.

Southern future

The manner in which the South has forged to the front in the manufacture of paper and paperboard as a result of the utilization of southern pine is shown by recent figures on pulpwood production. In the last year, pulpwood production in the South totaled 14,564,900 cords, or nearly 60 per cent of that of the entire country. Georgia provided 17 per cent of the southern total, and that state alone produced 10 per cent of the nation's total output. The outstanding feature of the situation, however, is the fact that an overwhelmingly large proportion of this output comes from either paper mill-controlled land which has been placed under scientific forest management, or from private woodlots, whose owners have been encouraged by the mills to grow pulpwood crops for sale to the mills. To foster such private woodlot development, the paper mills have made available scientific forestry guidance to all those interested in this means of augmenting the farmer's normal income.

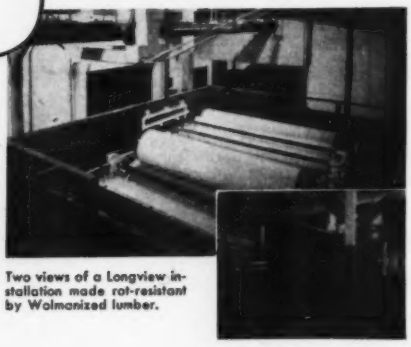
Financial Reports

An outstanding feature of the paper securities markets during the past month has been an upsurge in the quotations for preferred issues. While the market has been exceedingly dull, presumably waiting for a decision in the Korean peace negotiations, there were no notable changes in values of paper mill common stocks. However, the higher quotations for preferred issues indicates a basic public belief in the soundness of investments in this field.

Net incomes

American Box Board Co.—Net profit

This Everett, Wash. tank of Wolmanized lumber will last for years



Two views of a Longview installation made rot-resistant by Wolmanized lumber.

How Weyerhaeuser Timber Co. Uses Wolmanized Pressure-Treated Lumber

In its Longview and Everett, Washington plants, the Pulp Division of Weyerhaeuser Timber Company is experiencing the value of Wolmanized pressure-treated lumber.

Pulp production's just about the "wettest" wet process there is. One that would cause ordinary lumber to soften in a matter of months. Over sixteen years ago Weyerhaeuser used Wolmanized pressure-treated lumber in their Longview plant for the first time. In spite of decay-producing moisture, that first Wolmanized installation is still in good condition, still giving Weyerhaeuser service. And now the newest mill in the industry Everett, Washington, is being rot-protected by Wolmanized tanks, process equipment, and structural lumber.

Wolmanized lumber's resistance to rot is largely due to the fact that Wolman preservative solutions are *forced* deep into the fibers of the wood by high pressures . . . not just brushed on or soaked in. And Wolmanized pressure-treated lumber is odorless, non-oily, clean, and completely paintable.

Wolmanized pressure-treated lumber is distributed nationwide, since Wolman preservative treatment plants are located in all parts of the country. Learn how you can get lasting rot and termite protection for your wooden structures. For full information write:

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Offices: Little Rock, Arkansas • Portland, Oregon • Boston • Los Angeles
San Francisco • Baltimore • New York • Jacksonville, Florida • Seattle

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Lumber

for six months to May 31 was $741,416, compared with $631,945 a year before.

Champion Paper & Fibre Co.—Net income for the year ended March 31 was $8,873,918, as compared with $9,936,191 for the previous fiscal year.

Chesapeake Corp. of Virginia—Net income for three months ended May 31 was $1,060,574, as compared with $1,164,274 for the same quarter in 1952.

Container Corp. of America—Net earnings for the six months ended June 30 was $4,914,000, contrasted to $5,304,000 in the same period last year.

Continental Can Co.—Net income for the six months ended June 30 amounted to $6,911,364, as compared with $4,202,036 in the comparable period last year.

Deerfield Glassine Co.—Net income for the year ended February 28 was $129,721, as compared with $201,515 for the previous fiscal year.

Ex-Cello-O Corp.—Net profit for the six months ended May 31 was $2,693,746, as against $2,354,065 for the same period in 1952.

Federal Paper Board Co., Inc.—For 24 weeks to June 13, net income was $950,460, compared with $1,037,417 in the same 1952 period.

Hoberg Paper Mills—Net income for the year ended April 30 was $820,272.

Masonite Corp.—Net income for nine months ended May 31 was $2,402,804, as compared with $2,625,252 for the comparable period a year ago.

Mead Corp.—Net income for 24 weeks ended April 30 was $2,586,665, as against $2,322,313 a year previous.

Morris Paper Mills—Net profit for six months was $594,652, compared with $611,753 for the like period a year ago.

Pacific Mills Ltd.—Consolidated net profit was $3,120,344 for the year ended April 30, compared with $4,035,431 for the previous fiscal year.

Penobscot Chemical Fibre Co.—Net income for 1952 was $604,486, as compared with $654,995 in 1951.

Dividend declarations

Cornell Paperboard Products Co. has declared the regular quarterly dividend of 25 cents, payable September 10 to stock of record August 28.

Crystal Tissue Co. has declared the regular quarterly dividend of 15 cents, payable June 30 to record of June 20.

Eastern Corp. has declared a dividend of 25 cents per share on the common stock, payable September 1 to stockholders of record August 14.

Fox Paper Co. has declared a quarterly dividend of 50 cents a common share, payable June 13 to holders of record June 6.

Glatfelter Co. (P.H.) has declared a 25-cent dividend on the common, payable August 1 to record of July 15; also, the quarterly of 56¼ cents on the 4½

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per cent cumulative preferred, payable August 1 to record of July 15.

Hoberg Paper Mills Inc. has declared dividends of 34⅜ cents on the preferred and 37½ cents on the common, both payable July 1.

International Paper Co. has declared the regular quarterly dividends of $1 per share on the cumulative $4 preferred and 75 cents on the common, both payable June 29 to holders of May 29.

Kalamazoo Vegetable Parchment Co. has declared a 25-cent dividend on the common, payable June 10 to record of June 1.

Mead Corp. has declared a quarterly dividend of 40 cents per share on the common shares and the regular quarterly dividend of $1.0625 per share on the 4¼ per cent cumulative preferred shares. The dividends are payable September 1 to holders of record August 4.

Minnesota & Ontario Paper Co. has declared a quarterly cash dividend of 50 cents a share on the common, payable July 25 to holders of record July 2.

Nekoosa-Edwards Paper Co. has declared a second quarterly dividend of 40 cents a share, payable June 10 to shareholders of record May 29.

Northern Paper Mills has declared a quarterly dividend of $1 a share on the common, plus an extra of 50 cents, and a $1.50 quarterly on the 6 per cent preferred, second issue, all three payable June 10 to record of May 20.

Powell River Co. Ltd. has declared an extra quarterly dividend of 15 cents a share in addition to the regular 25-cent payment, payable June 15.

Sorg Paper Co. has declared a quarterly dividend of 25 cents a share on the common, payable June 25 to record of June 12.

Sutherland Paper Co. has declared a quarterly dividend of 37½ cents on the common and a quarterly of $1.10 on the 4.40 per cent cumulative preferred, both payable June 15 to record of May 15.

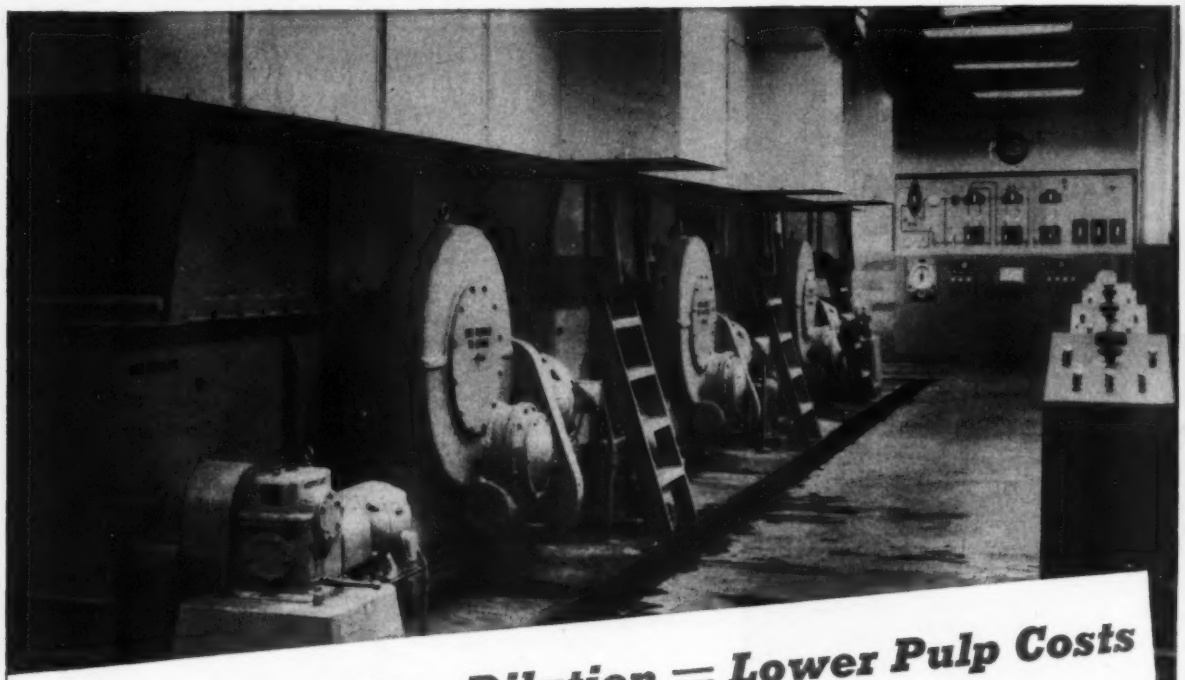
Whitaker Paper Co. has declared a quarterly of 25 cents on the common.

Paper mill corporate changes

American Tissue Mills of Holyoke, Mass., has resumed production on a limited scale to keep the company alive pending reorganization or sale.

Dixie Cup Co. has raised $2,000,000 by selling a 3¾ per cent note due November 1, 1971, to Prudential Insurance Co.

Glatfelter Co., P. H., has announced that its stockholders have voted to increase the authorized indebtedness of the firm from $5,000,000 to $7,000,000 and to sell to the Mutual Life Insurance Co. of New York $6,300,000 of first mortgage bonds due in 1973. The proceeds of the issue, which was placed



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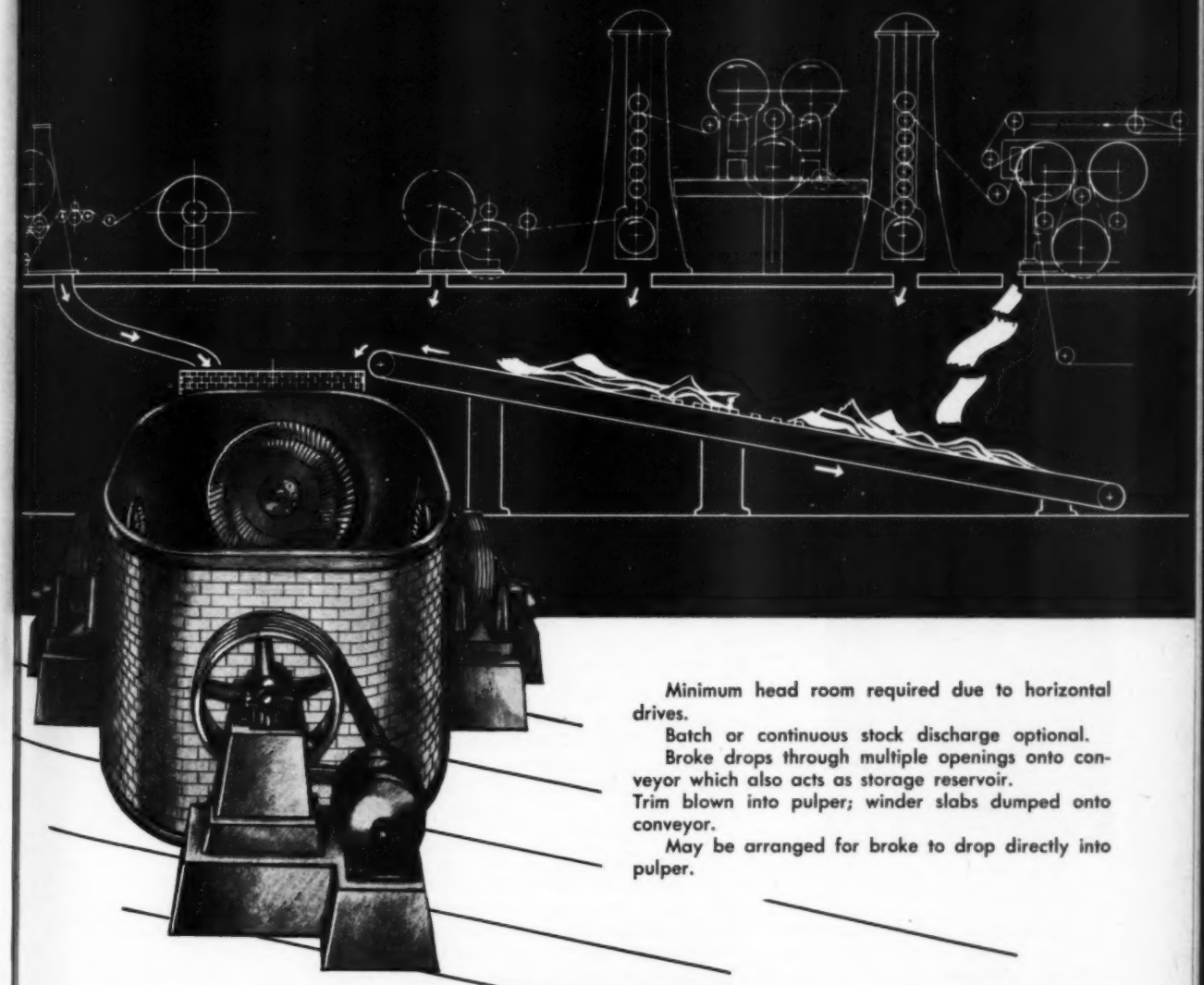

Minimum head room required due to horizontal drives.

Batch or continuous stock discharge optional.

Broke drops through multiple openings onto conveyor which also acts as storage reservoir.

Trim blown into pulper; winder slabs dumped onto conveyor.

May be arranged for broke to drop directly into pulper.

Quatro Pulper (18'x14') shown above processes water-repellent broke from a 216" machine operating at a rate of 400 tons per day.

RBR 8-53

RICE BARTON Research Corporation

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A Clark truck stacks paper rolls for the cutting machines at S. A. Pulp and Paper Industries Ltd., South Africa.

One Clark is used almost continuously in the sorting and inspection room.

Handling paper pulp. Says the manager of the department: "Without our Clarks, I would run out of floor space."

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CLARK FORK TRUCKS"

This case history came all the way from South Africa—how S. A. Pulp and Paper Industries Limited handles increased production with CLARK fork trucks. In the past two years, production has nearly doubled — *with no appreciable increase in labor costs or storage facilities!* Mr. J. Porteous, Manager of the Finishing Department, states:

> "I could never have handled the increase in production without the CLARK fork trucks. I know of no other handling system which could have handled our increased production as fast or as easily as our CLARK equipment."

This example is intended to give you an idea of what *can* be done when you take advantage of modern handling methods. Increased production means increased profits—if you hold down overhead costs. Why not let your local CLARK dealer give you the benefit of his experience in planning low-cost handling methods? He's listed under "Trucks, Industrial" in the Yellow Pages of your 'phone book—call him today.

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by First Boston Corp., will be used to retire the present outstanding first mortgage bonds, and the balance of $4,900,000 will be used to finance the new improvement program in the pulp mill and for working capital.

Hinde & Dauch Paper Co. is planning a stockholders meeting to authorize the doubling of the company's capital stock at such future time as the directors may deem it advisable, with a stock dividend available in the acquisition of other companies or properties.

National Container Corp. has been denied permission by the Interstate Commerce Commission to buy certain operating rights of American Coastal Lines. Competing transportation companies objected to National's control of a shipping line, when the company itself is a major freight shipper.

Paper Corp. of America has filed a voluntary petition in bankruptcy as a step toward effecting a reorganization of the company.

Saratoga Paper Co., Stillwater, N.Y., has passed into new hands and is now headed by Joseph Di Candia, president of Anjopa Paper & Board Mfg. Co. of Napanoch. The name of the mill will be changed to Dica Paper Mfg. Co.

Sweet Bros. Paper Mfg. Co. has been thrown into bankruptcy by stockholders who were dissatisfied with refinancing plans to meet their claims of $480,000. It is planned to sell the property as a going concern.

New York Stock Exchange—Stocks

	Closing Prices July 20, 1953	June 19, 1953
A.P.W. Products	* 3⅛–3⅜	3⅛
Celotex	17	17⅜
Same Preferred	* 16¼–16½	16¼
Certain-teed Products	13⅞	13⅝
Champion P.&F. Co.	27⅝	27⅝
Same Preferred	100½	93
Chesapeake Corp.	* 27½–28¼	28½
Container Corp.	39⅞	40
Same Preferred	* 97½–99	.....
Continental Diamond	11⅝	10⅝
Crown Zellerbach	28⅝	27
Same Preferred	98½	93½
Dixie Cup	* 34¼–35	32½
Eastern Corp.	* 14⅝–15	15
Robert Gair	18	17⅜
Gaylord Container	* 25⅝–26	26
Hammermill	* 14–14¼	13⅞
International Paper	50⅛	49¼
Same Preferred	* 96–98½	93½
Kimberly-Clark	42⅝–43⅝	40½
MacAndrews & Forbes	41	40½
Marathon	19½	20¼
Masonite	19¼	19¼
Mead Corp.	26⅛	24⅝
Same Preferred	87½–89½	87¼
National Container	10½	10
Rayonier, Inc.	26⅛	25⅝
Same Preferred	31	31⅝
Scott Paper	59½	58¼
Same $3.40 Preferred	* 86¼–88	86
Same $4 Preferred	*100⅝–101½	98
St. Regis Paper	22⅝	20¼
Same Preferred	* 93¼–93¼	92
Sutherland Paper	27	26¼
Same Preferred	*103–104	100
Union Bag & Paper	43⅝	43⅞
United Board & Carton	* 13⅝–14⅛	13⅝
United Wall Paper	2⅝	2⅜
Same Preferred	* 21–21½	24
U.S. Gypsum	107¼	108
Same Preferred	*165–167	161¾
West Virginia P.&.P.	73	69
Same Preferred	*104⅜–106	105⅜

New York Stock Exchange—Bonds

Celotex 3½%	98⅝	.....
Champion P.&P. Co. 3%	.....	.....
Mead Corp. 3%	.....	.....

American Stock Exchange—Stocks

Am. Writing	10⅝	.....
Brown Co. Common	9¼	8⅝
Same $5 Preferred	.....	.....
Same $3 Preferred	.....	.....
Great Northern Paper	52½	53½
Puget Sound	26⅝	26¼

*Closing Bid and Asked Prices.

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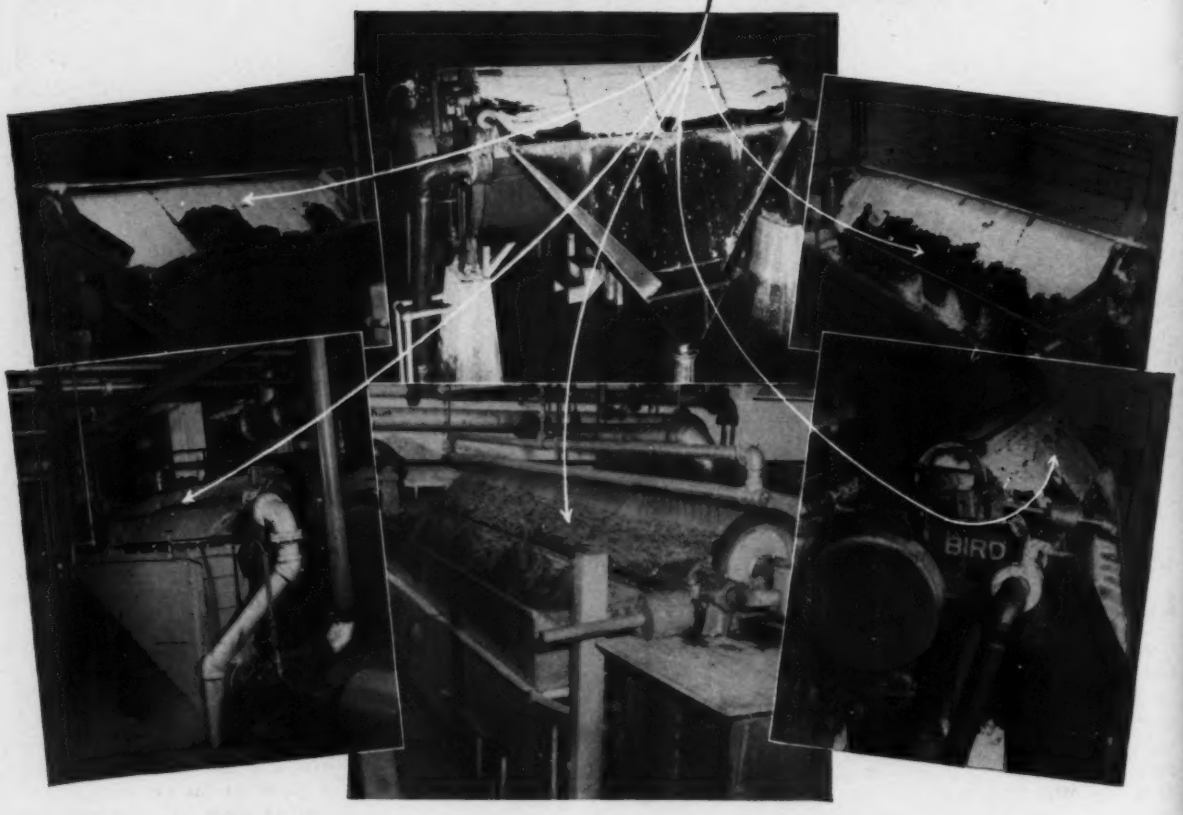

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are rescuing and returning tons and tons of it, to be made into good, profitable paper at lowest cost per ton.

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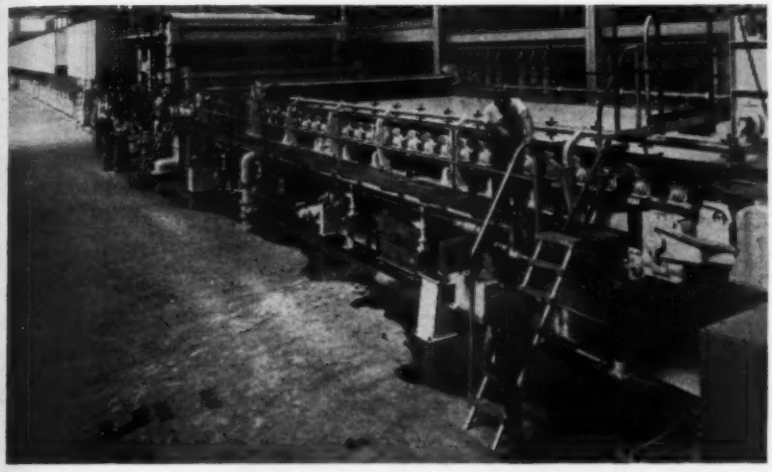
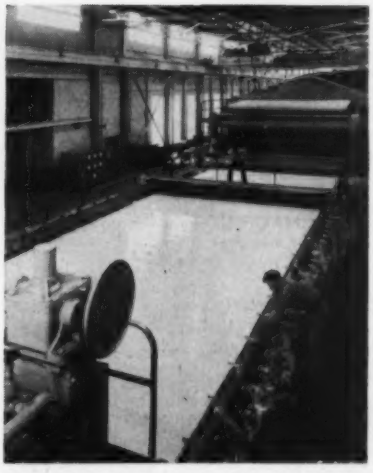
News of the Industry



WET END VIEW of new Beloit Iron Works fourdrinier recently installed at Covington, Va., mill of West Virginia Pulp & Paper Co.; known as No. 8, the machine is capable of speeds up to 2,000fpm



CLOSE-UP of wire section of new fourdrinier; the wire width is 216 in., while the trim is 194

West Virginia Adds New Machine; Latest Step in Covington Program

ONE OF THE LAST of a series of major projects in a long-range modernization program reached completion in July as West Virginia Pulp & Paper Co. placed a new paper machine in operation at Covington, Va. Since the end of World War II the firm has created an almost entirely new pulp and paper mill at Covington.

Installation of the papermaking equipment culminated three years of planning and a year-long construction job that was completed nine days ahead of schedule.

Designated as No. 8, the Beloit Iron Works fourdrinier machine represents the latest in papermaking equipment and replaces two small units that had been in operation some 40 years and were considered obsolete. Since great stress will be placed on quality and uniformity, the new machine will not result in greatly increased production.

Installation of the new machine is the latest phase of a broad modernization program that has resulted in the mechanization of the plant's woodyards, the rebuilding and consolidation of its pulp mills, the expansion and modernization of its power house and recovery facilities, and the rebuilding of three of its larger existing machines.

The addition of No. 8 gives the mill a line of six paper machines and three board machines, with a total capacity of about 650 tons of paper and paperboard per day. When its "shakedown" is completed, No. 8 is expected to produce at the outset about 200 tons daily.

The machine will make heavy grades of bleached paperboard used in the manufacture of food containers, butter cartons, milk bottles, ice cream cartons, paper cups, file folders and other products.

Although designed primarily to produce heavy-weight food container papers, the Beloit unit and its auxiliary equipment, according to plant officials, are entirely flexible and can be easily altered to produce almost any grade or basis weight.

In addition to the installation of the machine itself, the paper mill project called for the complete rebuilding of the structure that formerly housed the two older machines; also, the installation of a new pulp preparation system and new finishing facilities.

Completely automatic

From the vacuum-pressure headbox to the Beloit winder, operation is controlled by sensitive and accurate electrical and pneumatic devices that assure a product of top quality and uniformity. The elimination of many of the usual manual functions has both eased the operation and led to efficiency and accuracy.

A total of 350 electrical control stations are built into the machine; the instrumentation system is one of the most modern and extensive available. One panel alone—at the wet end—remotely controls 42 pieces of equipment. Control instruments and valves are the products of Mason-Neilan Regulator Co.

The machine has an extensive alarm system, consisting of electrically controlled horns, sirens, bells and lights that

NEWS HIGHLIGHTS

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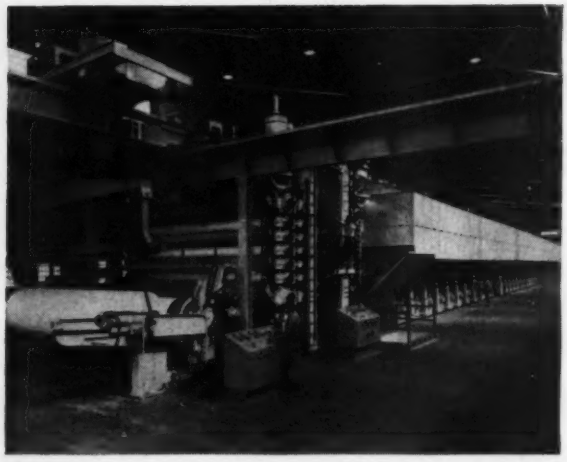
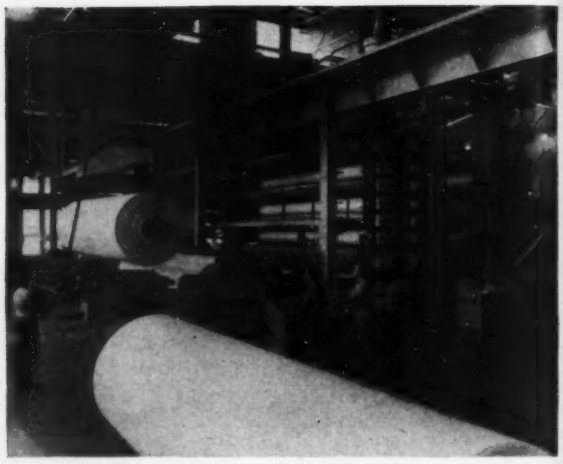


NO. 8 MACHINE at Covington from the dry end; unit replaces two older machines and makes heavy grades of bleached paperboard



DUAL CALENDER STACKS and reel assemblage, along with the console control panels used to operate the Covington equipment

warn the operators when abnormal conditions exist. Another feature is a direct-wire telephone system that permits instant communication between crew members no matter where they may be stationed.

Power to the machine is by a Westinghouse Electric Corp. 1900 hp steam turbine turning a Westinghouse line shaft differential drive capable of propelling the machine at speeds ranging from 200 to 2,000 fpm. A total of 212 electric motors—from 1/6 to 600 hp—are used to operate various units of the machine, while 25 generators furnish power or function as regulators for automatically operated equipment. VS units, motors and controls were manufactured by Reliance Electric Engineering Co., Cleveland.

Fourdrinier removable

No. 8 is equipped with a 216-in. wire capable of forming a sheet that will trim to a width of more than 16 ft. The fourdrinier section is removable, permitting easier and faster wire changes.

Specially designed to produce high-quality papers from local hardwood pulps, the Beloit is equipped with three press sections, a smoothing press, size press, breaker stack, and two eight-roll calender stacks.

Paper is dried by 76 steam-heated steel cylinders of 5-ft. diameter and 15 felt dryers. The dryer sections are covered with a large J. O. Ross Engineering Corp. hood that forms part of an up-to-date ventilating system, which provides not only maximum drying efficiency, but also greater comfort to employees.

One installation new to machine operations at Covington is a Shartle Bros. Machine Co. hydrapulper located beneath the dry end. This equipment is used to continuously repulp rejected paper from the machine and is capable of repulping the entire output in case of emergency. Stock from the hydrapulper is pumped automatically to a storage chest for re-use in the system without the loss of quality because of the introduction of dirt or other impurities. Efficiency is furthered since it is no longer necessary to strip down rolls for repulping by more conventional equipment.

Other features include an enclosed gear system contributing both to efficiency and safety and a central pressurized oiling system that provides greater protection and eliminates manual oiling. The operating floor is illuminated by 220 lamps of the 750-watt size and about 800 smaller units needed for lighting in the immediate machine area.

Suppliers to Covington Project

Machine and winder	Beloit Iron Works
Air system and hood	J. O. Ross Engineering Corp.
Stock chest agitators and hydrapulper	Shartle Bros. Machine Co.
Dryer drainage system	Midwest-Fulton Machine Co.
Couch pit, machine and beater chest agitators and stock thickeners	Improved Machinery Inc.
Dirtecs and felt conditioners	Bird Machine Co.
Control instruments and valves	Mason-Neilan Regulator Co.
Consistency regulators and valves	DeZurik Shower Co.
VS units, motors and controls	Reliance Electric & Engineering Co.
Roll header	Valley Iron Works
Turbine drive, motors, and electric equipment	Westinghouse Electric Corp.
Stock meter	Trimbey Machines Inc.
Stock refiners	Sutherland Refiner Corp.
Vacuum pumps	Nash Engineering Co.
Pumps	Ingersoll-Rand Co.
Tile linings and stock chests	Stebbins Engineering & Mfg. Co.
Machine room cranes	Harnischfeger Corp.

Stock preparation

An advanced stock preparation system, specially developed for the most efficient utilization of local hardwoods, has been installed on No. 8. Among the devices is a large battery of Bird Machine Co. dirtecs for the separation of dirt and other foreign material from the pulp.

A Waco filtering system removes fine fibers from the water used on the machine, permitting the re-use of both.

Other auxiliary equipment includes a Beloit rewinder; a table for the easier handling of rolls during inspection, wrapping and stenciling, and an automatic Valley Iron Works roll header. Electrically-driven overhead cranes manufactured by Harnischfeger Corp. move rolls from the reel to the finishing equipment.

Construction efficiency

Installation of the machine and its auxiliary equipment in the mill required thorough planning in order to minimize the production losses resulting from the shutdown of the two older machines, Nos. 3 and 4, which partially occupied the space allotted to No. 8.

To keep the older machines running as long as possible, crews reconstructed the building and installed the fourdrinier section of the new machine and the calender stacks and the reel at the dry end, along with rewinder and finishing equipment, while Nos. 3 and 4 remained in operation. During this same period, a large part of the piping and electrical work was completed.

At the end of March the two old machines were dismantled and the remaining sections of No. 8 installed. No. 3 was sold to a manufacturer in Ohio, while No. 4 was dismantled for parts.

Union Bag Completes First Step in Expansion Program

During May No. 6 paper machine went into production at the Savannah, Ga., plant of Union Bag & Paper Corp. to mark completion of the first major step in the firm's current multi-million dollar expansion program. The new unit is designed to turn out a 20-foot wide

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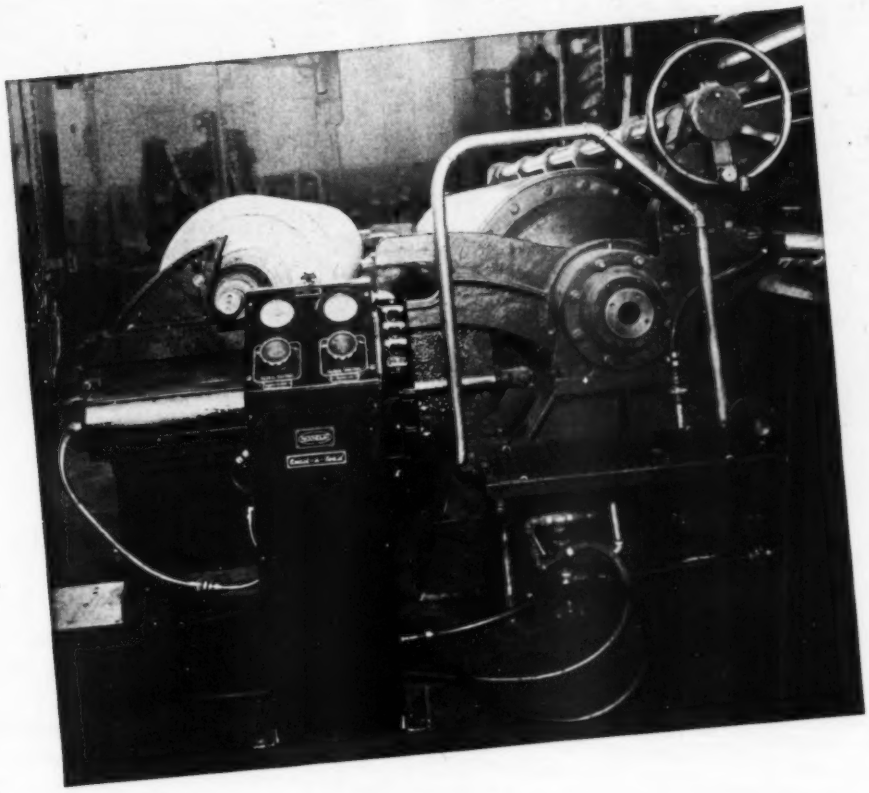


Modernize with a NEW Puseyjones Reel...

Since the introduction of the Puseyjones Improved Type Uniform Speed Reel several years ago, numerous installations have been made in connection with new machines and to replace obsolete equipment on existing machines.

In many instances, the satisfactory performance of a new Puseyjones Reel has resulted in subsequent orders from the same mill.

An outstanding feature of this Puseyjones unit is the pneumatic adjustable loading mechanism which greatly simplifies reel changes and gives added safety to the operation. There's no loss of valuable production time. Operation is at constant paper speed. Controlled tension and accurate roll-to-drum pressure results in uniform rolls. Smoother winding and ease of operation are additional features.

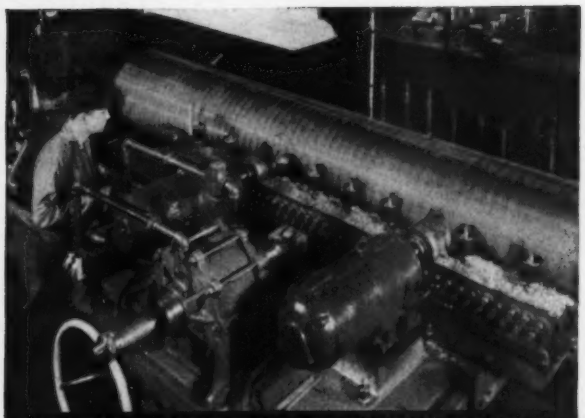
Find out how a Puseyjones Improved Type Uniform Speed Reel can improve your production and give you more uniform paper rolls for better profits. Write us today – we will have our District Representative call.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery

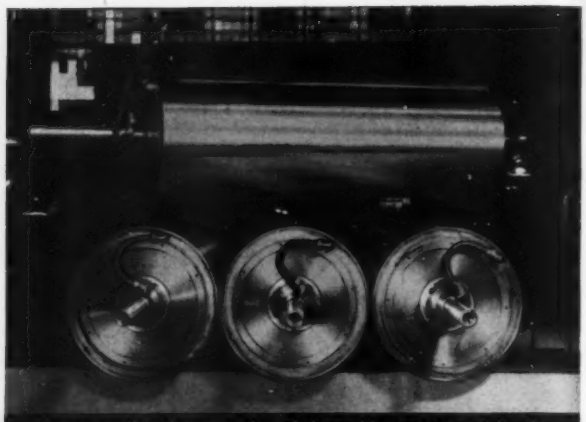
Fabricators and Welders of all classes of Steel and Alloy Products

Wilmington 99, Delaware, U.S.A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY



Centrifugally cast bronze suction press roll shell being drilled on special machine developed by Shenango.



Bronze cooling drums, each with brazed-in spacers and heads and with steel journals.

Shenango Qualities mean longer roll life

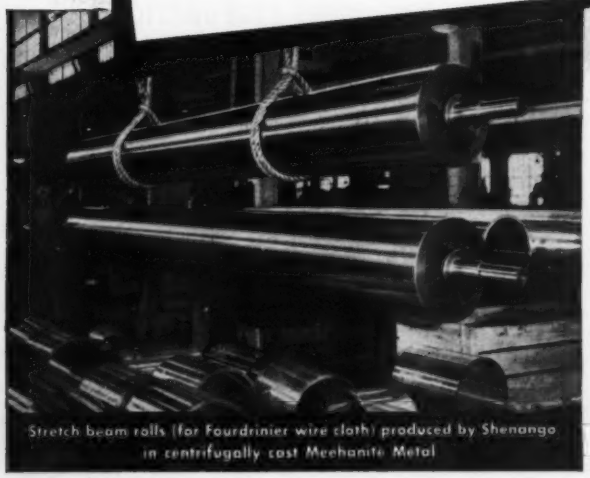
SHENANGO-made rolls, simple or complex, large or small, have one important thing in common. They are cast by the Shenango highly advanced centrifugal process. This means stronger, pressure-dense metal with finer grain... better able to withstand friction as well as pressure and heat stresses.

This, together with Shenango's modern machining and finishing facilities, adds up to superior, money-saving performance for rolls, roll cores, drums and assemblies made precisely to your specifications.

It will pay you to specify Shenango. For further information or data on meeting your specific needs, write to: Shenango-Penn Mold Company, Centrifugal Castings Division, Dover, Ohio (Executive Offices: Pittsburgh, Pa.).

SHENANGO

ALL RED BRONZES • MANGANESE BRONZES • ALUMINUM BRONZES
MONEL METAL • NI-RESIST • MEEHANITE METAL



Stretch beam rolls (for Fourdrinier wire cloth) produced by Shenango in centrifugally cast Meehanite Metal

Bronze breast roll with steel inserts, centrifugally cast, finished and assembled in the modern Shenango shops

sheet of kraft at the rate of 2,000 fpm.

Pusey & Jones Co. built the machine, while Tuttle Co. installed it. D. L. Calkins was Union Bag's project engineer on the job.

Meanwhile, another step in expansion at the Georgia plant was finished with the turning of water into the new wood conveying flume system, which stretches 3,250 ft. through the woodyard.

Besides the flume, projects involved in the program pertaining to wood handling expansion will include a new chip room, a new screen room, barking drums, and two 60,000-cu. ft. storage silos—one for pine and one for hardwood chips. Most of this equipment will be put into immediate use, while that which is designed to handle the hardwood chips will begin operation in the fall, when the new semichemical pulp mill is expected to go into production.

The semichemical unit will utilize gum or hardwoods in the production of pulp that will be made into corrugating medium for use in the manufacture of shipping containers.

45,000 gpm

The giant flume, while not new to the pulp and paper industry, is in use for the first time at the Savannah plant for conveying logs to the barking drums. The pump used for circulating the flume water has a capacity of 45,000 gallons per minute. Make-up water is to be obtained from mill effluent. The logs will travel through the flume at the rate of 5 ft. per second; the flume is designed to move 200 cords per hour.

The new wood handling installations supplement and to some extent replace the present facilities. The combined system will handle approximately 3,000 cords of pine and hardwood daily.

MACHINE TENDER Roy O'Neil watches the tolerance lines as the basis weight is recorded on the Accuray recorder

ACCURAY ADJUSTABLE detector arm picks up the beta ray impulses radiating from a sealed source directly above

Beta Rays Guide Papermakers at Wausau Paper Mills

Wausau Paper Mills Co. at Brokaw, Wis., has recently installed a beta ray instrument to guide papermakers in tighter basis weight control. The gauge, which uses Strontium 90, a radioactive isotope, was developed and installed by Industrial Nucleonics Corp. of Columbus, Ohio.

While the gauge measures the thickness of paper with an accuracy unknown until recently, it is basically simple. The two principal parts of the instrument are contained in a horizontal V-shaped frame that houses the Strontium—the source of radiation. The detector mechanism, directly above, picks up beta ray radiation through the sheet passing to the calender stacks. The fraction of rays stopped are in proportion to the weight per unit area. Impulses are charted at the recorder and present a detailed history of the run, showing the exact basis weight between high and low tolerance lines.

Every 30 minutes the instrument automatically compensates for variables such as temperature, humidity, and possible accumulation of dust at the source and detector units. The accuray recorder is calibrated in accordance with the various weight ranges of Wausau papers. By watching the profile sheet, operators are able to make fast adjustments for uniformity.

Multiple Log Conveyor System in Operation at H & W Mobile Plant

THE RECENT ADDITION of two barking drums at the Mobile, Ala., mill of Hollingsworth & Whitney Co. has necessitated the installation of an entirely new log conveyor system. The operation was designed and constructed by The Rust Engineering Co. of Pittsburgh in connection with H & W's Alabama expansion program.

The yard section of the system, installed during a two-week vacation shutdown, had to be re-designed to feed four barking drums instead of two without changing the original two-conveyor arrangement at the unloading source in the woodyard. This meant that two barking drum feeder conveyors must stem from each yard conveyor.

In application, a splitter chute was devised that would enable each yard conveyor to transfer its load concurrently to two conveyors, each one feeding a barking drum. A satisfactory division of logs at the transfer point is obtained by adjustment of the splitter chute; this load cleavage has been checked by actual count and found to be well balanced and consistent.

Change from usual practice

The conveyor structure is of the usual open frame type except that the wearing base is of high-carbon steel; while the chain—hanging from its attachments—travels suspended in a trough below the conveyor bed. The latter arrangement, a change from the usual log conveyor practice, has worked well, according to spokesmen for the firm. The special design of the chain itself has also contributed to the system's steady operation at lowered cost.

A single-strand chain of manganese steel was developed by the American Manganese Steel Division of American Brake Shoe Co. for use on large log hauls on the West Coast. The Hollingsworth & Whitney installation is believed to be the first in a southern mill.

The chain—with attachments—was selected for high tensile strength and wearing capacity embodied in a specially designed construction. The links are thicker at their articulations and have good shock-bearing properties.

The conveyors themselves are of a heavier construction than is usual; however, their design has been justified, particularly in the yard conveyors, which

NEW BARKING DRUMS and new feeder conveyors at Hollingsworth & Whitney pulp and paper mill at Mobile

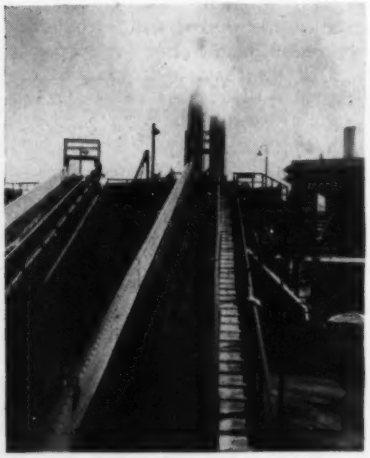
are subjected to sudden heavy strains when log loads are dumped. Here, conveyor troughs were given extra strength by using structural steel members, rather than plate. This also allows easier repair, since a damaged member can be removed by cutting spot welds at either end.

50 cords per hour

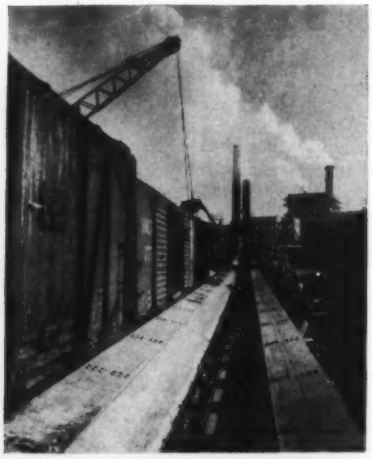
Conveyors are water-lubricated to reduce wear; and no wood is used at all in their construction; the walkways are of reinforced concrete plank. As to operating capacities, a single yard conveyor receiving from trucks and rail cars has successfully handled 50 cords per hour.

Logs leaving the barking drums are sorted on steel slat conveyors, which were selected because they tend to place the logs in better positions for inspection and removal.

In the new system particular attention was given to the conveyors feeding the chippers, which are the 96-in., 10-knife type rated at 60 or more cords per hour. To derive the full benefit of this capacity, chipper feed conveyors using the manganese steel chain with a variable speed drive were installed. This design gives maximum chipper capacity at optimum speed, while enabling the operation to function more efficiently over a wide range of capacity.



CONVEYORS feeding barking drums; note heavy-duty manganese steel chain hanging from its attachments, which was originally designed for log hauls



NEW YARD conveyor; trough is constructed of structural steel members rather than plate; repairs can be made by cutting spot welds at either end

C-Z May Construct Pulp Mill at Duncan Bay

J. D. Zellerbach, president of Crown Zellerbach Corp., told a meeting of business men in Campbell, Ont., recently that C-Z is considering plans to construct a $25,000,000 pulp mill at the site of the present Duncan Bay, B.C., newsprint mill.

Mr. Zellerbach said that the contemplated pulp facility would have a capacity of 300 tons daily, and that he expected it would be built "within one to three years."

Certain-teed to Construct Felt Mill in Oklahoma

Certain-teed Products Corp. of Ardmore, Pa., has announced that it will build a felt mill near Pryor, Okla. The mill, which will produce dry felt base for asphalt roofing and sidings, will be located at the site of the firm's Pryor paper mill.

Plans are still in the formulative stage, according to Paul E. Fischer, vice president in charge of manufacturing operations. The mill's daily production capacity will be about 50 tons of dry felt. Design, layout and engineering will be under the direction of Walter G. Wili, Certain-teed chief engineer.

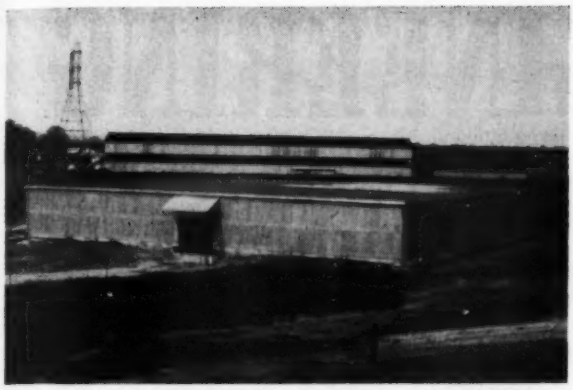
Dry felt produced at Pryor will be used in the manufacture of asphalt roofings and sidings at plants in Kansas City, Mo., and Dallas. "The Pryor mill will give us a dry felt source conveniently located to both our Dallas and Kansas City operations," Mr. Fischer declared, "and will make it unnecessary to divert felt produced at our other roofing plants."

The mill is to be built on the 30-acre site occupied by Certain-teed's paper mill, located about one mile from the Grand River Dam Authority power plant near Pryor. The paper mill was completed last year to produce liner board paper used in the manufacture of gypsum lath, wallboard, and sheathing at the firm's gypsum plants. The liner board paper is manufactured from old paper—mostly newspapers, sulfite, groundwood, and screenings, whereas rags, wood and paper are used in making dry felt.

National Container Leases Illinois Plant Site

Samuel Kipnis, president of National Container Corp., announced recently that the company had entered into a long-term lease covering a large tract of land and buildings at Madison, Ill. The land, which is just across the river from St. Louis, was formerly owned by American Car & Foundry Co.

Improvements to the property will be made in the near future, some of which will be used in the manufacture of the



NEW $50,000 warehouse at The Crystal Tissue Co., Middletown, Ohio; structure is being used chiefly to store Christmas gift wraps and finishing materials required for the manufacturing process

INTERIOR VIEW shows storage facilities; the warehouse has four loading entrances, one on each side, with the main entrance large enough to accommodate two trucks at once

company's products. The tract covers 56 acres, boasts 10 miles of railroad track, and has five large one-story buildings and additional smaller structures with an aggregate of approximately 750,000 sq. ft. of floor space.

Expansion Notes

Fibreboard Products Inc.
has installed a giant press at its Stockton, Cal., plant capable of printing five colors at one time on paperboard. It is the first Miehle five-color paperboard rotary press on the Pacific Coast and has a capacity of 5,500 impressions per hour.

Halifax Paper Co.,
Roanoke Rapids, N.C., has announced purchase of 6,500 acres of timberland near Tillery from Cary Lumber Co. at Durham. The new tract brings the company's holdings to 130,000 acres.

Shawano Paper Mills,
Shawano, Wis., has purchased a one-story building at Gresham. Converting equipment is to be installed on or before September 1. The building was formerly owned by Belle City Glove Co.

Rayonier Inc.,
currently constructing a $25,000,000 chemical cellulose plant in Jesup, Ga., will soon begin work on a new office building at that city. The structure, which will house the firm's southeast area office, will be of one-story design and will cover approximately 4,200 sq. ft.

Milprint Inc.,
Milwaukee printing and packaging firm, has announced that J. P. Bemberg, A. G., German manufacturer of an equivalent of cellophane called Zellglas, has become its newest foreign affiliate.

Weyerhaeuser Timber Co.
is planning the construction of an office building in Centralia, Wash. The 6,000-sq. ft. structure will house the offices and laboratories of research foresters, timber cruisers, and local land agents. Garages and an experimental greenhouse may be built at the rear at a later date.

Container Corp. of America
plans to start construction of a corrugated board plant at Fernandina Beach, Fla. The firm now operates a kraft mill at Fernandina Beach, and the new plant will utilize pulp from this mill.

Continental Can Co.
has purchased the flexible packaging business of Shellmar Products Corp. of Mount Vernon, Ohio. The sale was subpect to the approval of Shellmar stockholders.

Paper Manufacturers Top 1951 Loan Mark by 37%

Despite the much-publicized tightness of the long-term money market, manufacturers of paper and kindred products succeeded during 1952 in obtaining 37 per cent more long-term money from life insurance companies and other institutional investors than in 1951. In 1952, thirty-three firms received $207,196,000 from privately placed loans, as against $150,371,000 to 31 manufacturers in 1951. These figures were recently published in "The 1953 Yearbook of Private Placement Financing," distributed by E. V. Hale & Co., Chicago.

Total private placement financing in 1952 amounted to $5,032,803,000, as compared with $5,085,238,000 the year before, with 1,124 issues in 1952, as against 1,256 in 1951. Industrial corporations accounted for $3,249,588,000, or 65 per cent of the total, as compared with $3,564,000,000, or 70 per cent, in 1951.

Integrated pulp and paper manufacturers got the largest share of the money loaned in their field, with 13 loans aggregating $95,530,000, while a manufacturer of pulp exclusively obtained $36,000,000. The latter was Ketchikan Pulp Co., and its $36,000,000 issue of 4¼ per cent 20-year first mortgage bonds was the second largest in this field; it was taken by a group of institutional investors. Largest loan in the field was $37,500,000 to Bowaters Southern Paper Corp., which took the form of 4.75 per cent first mortgage bonds due in 1973; the issue was sold to 12 life insurance companies.

Other Loans

Other loans to integrated paper companies included the following: Oxford Paper Co., $10,000,000; St. Lawrence Corp., $8,000,000; S. D. Warren Co., $7,000,000; Minnesota & Ontario Paper Co., $6,000,000; The Mead Corp., $5,500,000; Champion Paper & Fibre Co., $5,000,000; Rhinelander Paper Co., $4,500,000; Mosinee Paper Mills, $3,500,000; Thilmany Pulp & Paper Co., $2,880,000; Detroit Sulphite Pulp & Paper Co., $2,150,000; Hudson Pulp & Paper Corp., $2,000,000, and Riegel Paper Co., $1,500,000.

Eight other paper manufacturers obtained $11,566,000. Largest of these loans was $6,000,000 to Ecusta Paper Co., a subsidiary of Olin Industries Inc. This took the form of an issue of guaranteed 3.75 per cent 19-year notes, sold to a life insurance company. Others in this group included Gould Paper Co., $2,500,000; Hopper Paper Co., $1,500,000; W. W. Fitzhugh Inc. & Orlando Ave. Corp., $700,000; Beckett Paper Co., $450,000; Stevens & Thompson Paper Co., $216,000, and two loans of $100,000 to Parker Schmidt & Tucker Paper Co. and Hurlburt Paper Co.

Converters got $4,800,000

Five paper converters borrowed an aggregate of $4,800,000. Largest of these was an issue of $2,500,000 in 4¼

TOTAL ENGINEERING

It's one reason why LINK-BELT gives you better belt conveyors

Demonstrating three phases of chip and sawdust handling, Link-Belt high-capacity belt conveyors at left and right, respectively, transfer chips to storage and screening house. Center conveyor moves sawdust to disposal.

WHETHER your handling requirements are simple or complex, you'll find the right answer at Link-Belt. For Link-Belt Belt Conveyors are "totally-engineered." That means every component is matched to the exact needs of the job. And the Link-Belt engineering organization will follow through from start to finish—in the designing, manufacture and erection of all your conveying equipment.

Get all the facts from the Link-Belt office near you. Link-Belt engineers—working with you and your own staff—will help you get the finest in belt conveyors.

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BELT CONVEYOR EQUIPMENT

LINK-BELT builds a complete line of belt conveyor components

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ALL TYPES OF ROLLER BEARING IDLERS

20° troughed idler

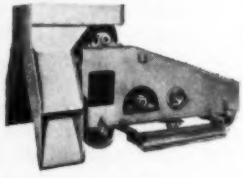
45° troughed idler

Return idler

Belt-training idler

Flat-roll idler

BELT AND MOTOR PROPELLED TRIPPERS



COMPLETE DRIVES AND TERMINAL MACHINERY

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle; Scarboro, Toronto and Elmira, Ont. (Canada); Springs (South Africa); Sydney (Australia). Sales Offices in Principal Cities. 13,230

per cent 20-year first mortgage bonds placed for Keyes Fiber Co. with four life insurance firms. Other loans included $1,000,000 to Arkell & Smiths, $700,000 to Imperial Paper & Color Corp., $300,000 to Butler Paper Products Co., and $300,000 to Minerva Wax Paper Co.

Five paperboard manufacturers obtained private placement loans totalling $35,300,000, the largest of which was an issue of $20,000,000 in 4 per cent 30-year bonds of Robert Gair Co. Inc. Second largest was $9,300,000 in 4 per cent 18-year first mortgage bonds placed with an institution for Southern Paperboard Corp. Gaylord Container Corp. obtained $3,000,000 through sale of 3.625 per cent 20-year notes to a life insurance company, and Manchester Board & Paper Co. and Green Bay Box Co. received $2,500,000 and $500,000 respectively.

18 Paper and Paper Products Firms Honored for Reports

Eighteen paper and paper products firms are candidates for "Oscar of Industry" awards given each year by *Financial World* for excellence of annual financial reports.

A total of 1,923 industrial corporations and financial institutions have been cited "for producing informative annual reports for 1952." This number compares with 1,658 cited a year ago. They are qualified for the final judging for the bronze Oscar trophies. In its 30th international competition, the national weekly financial magazine rated a total of 5,000 annual reports entered from all over the Western Hemishpere.

During the summer an independent board of judges will consider the 1,923 merit-rated annual reports to select the best in each of 100 industrial classifications.

Firms in the paper field that have qualified for the award are: American Greetings Corp., American Seal-Kap, Bemis Bros. Bag Co., R. L. Crain Ltd., Dennison Mfg. Co., Diamond Match Co., Kalamazoo Vegetable Parchment Co., Moore Corp. Ltd., Northern Paper Mills, Ohio Match Co., Old Town Corp., Scott Paper Co., Shellmar Products Corp., Union Bag & Paper Corp., Sonoco Products Co., U.S. Envelope Co., U.S. Playing Card Co., and Universal Match Corp.

Customs Court Cases

The Bureau of Customs has issued a ruling instructing Customs officials to ignore—in further classification of paper claimed to be standard newsprint—a Customs Court decision that held sizing was not a characteristic to be measured in determining whether paper is duty-free newsprint of dutiable printing paper. The ruling was issued in order to permit the presentation of more complete evidence as to the use of sizing than was available when the original case was tried at Portland, Ore., according to Warren B. Bullock, manager of the Import Committee of the American Paper Industry.

The Attorney General's office has filed an appeal to the United States Court of Customs and Patent Appeals from a decision of the U.S. Customs Court that converter rolls of toilet paper are dutiable at 15 per cent as paper cut into shape, and not as manufactures of paper at 17½ per cent. This was a Pacific Coast importation, and a large number of other cases are pending in various parts of the United States involving the same issue.

March import statistics showed the highest total value of imports of dutiable paper for a single month since the Reciprocal Trade Agreement Act was passed in 1934. The increased imports were largely in the kraft paper and the paperboard field. Imports of test liner from Finland totaled more than 3,000 tons.

Sutherland Cites Problems of European Paper Industry

Lionel Sutherland of Sutherland Refiner Corp., Trenton, N.J., recently returned from an extended tour of European papermaking facilities, which included visits to mills in England, France, Italy and Finland and discussions with paper firm executives.

Among observations Mr. Sutherland made of the continental industry was the fact that in England and France the great majority of mills are either not integrated at all or only partly so. The English mills depend largely on Scandinavian pulps for their operations. He also noted that in Europe a number of firms are operating combination machines, i.e., the wet end is composed of both fourdrinier and cylinder sections.

The relative high cost of power and equipment, coupled with the comparatively low cost of labor, Mr. Sutherland declared, has brought about a situation in Europe vastly different from that in the United States in that much more labor is required to operate the mill.

Smaller mills

The basic difference noted between U.S. and European mills is the size, continental units being much smaller.

Mr. Sutherland was impressed by the high degree of land usage, especially in northern Italy. However, on the continent as a whole the large population and the demand for food prevents the development of large resources of pulpwood. For this reason, most European countries—with the exception of those in Scandinavia—rely on imported pulps.

Finland's standard highest

Its fine pine stands and modern paper mills bring Finland the recognition as that nation with the highest standards in the industry on the continent. Since the war, Finnish paper companies have tended more to manufacturing their pulp into paper and exporting the finished product than concentrating on making and selling pulp to the export market. Finnish mills have an adequate supply of pulpwood and reasonably adequate power resources, which permit their operation to be more nearly on U.S. standards.

Hoberg and Northern Report Progress in Pollution Battle

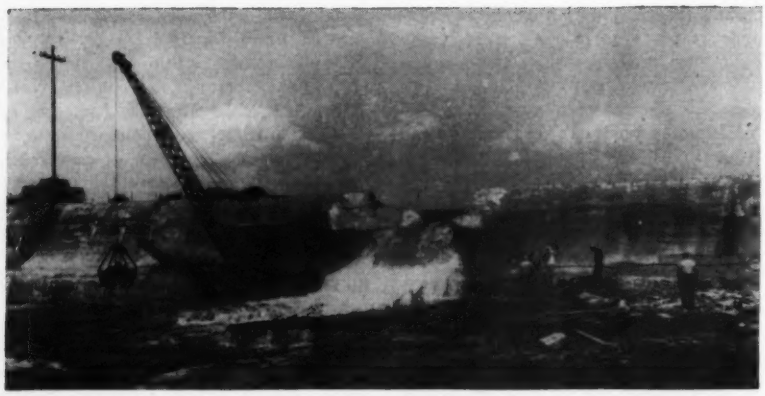
TWO GREEN BAY, Wis., paper mills are moving fast toward the completion of major anti-pollution projects that are expected to be among the largest and most effective plants of their kind.

Spokesmen for Hoberg Paper Mills have told the State Committee on Water Pollution that its $2,500,000 plant project for preventing wood sugars from entering the Fox River is "coming along well on schedule." Construction has been under way for more than three months, and much of the plant equipment is already delivered or in process of manufacture by suppliers.

The plant will utilize a process recently perfected by Wisconsin pulp and paper industry researchers for manufacturing a useful product from the wholesome sugars that are dissolved out of the wood chips in making pulp.

In his company's report, M. J. Auchter, vice president for manufacturing, reminded state authorities that the project consists of three phases: A tunnel more than 6 ft. sq. on the inside and 3,150 ft. in length will bring steam from the boiler house for plant operation; the plant itself — boasting more than 500,000 cu. ft. — will manufacture torula yeast from the spent sulfite liquor, while an installation of pumps and tanks and presses will collect the liquor for processing.

More than half the tunnel construction has been completed in barely half the contract time. The two tremendous fans required for ventilating the tunnel have been delivered, and the remainder of the equipment is in process or on order. Yeast plant equipment is in various stages of delivery and manufacture, Mr. Auchter stated. Foundation plans will soon be ready to submit to the State



WATER POURS through break in dam on Escanaba River as Escanaba Paper Co. repairs the structure; a segment had been dynamited in preparation for the removal of concrete that had been crumbling; new concrete was later poured

Industrial Commission, and construction will start promptly after official approval is received.

Heart of the Hoberg torula yeast plant will be the process worked out as a sulfite pollution abatement measure by the scientific staff of the Sulphite Pulp Manufacturers' Research League, Appleton. The process places torula yeast organisms in the spent sulfite liquor, where they propagate rapidly under scientifically controlled conditions. The yeast eats the sugars, which otherwise would go into the stream, where sugar decreases the supply of dissolved oxygen available for fish. After propagation, the yeast is separated from the desugared liquor and dried. In this state torula yeast is a vitamin-rich protein substance that is rapidly gaining ever greater acceptance as a supplement for animal foods and as a material from which are derived important human nutrients and pharmaceutical products.

World's largest

Completion of the world's largest pollution control plant for evaporating and burning spent sulfite liquor as industrial fuel is scheduled by Northern Paper Mills for Labor Day or before. The announcement was made by Milan Boex, Northern president.

Until that time, he said, Northern is carrying on an interim program that will approach keeping about 40 per cent of its sulfite solids out of streams; this through their use as a roadbinder on northeastern Wisconsin city streets and highways.

All heater and vapor bodies for the firm's new evaporator plant are now in place, and the necessary large connecting piping has been installed. Work is being rushed to completion on smaller piping that connects the big equipment with controls and instruments.

Principal job left undone is to install fly-ash collectors for intercepting the fine ash resulting from burning spent liquor. A big new boiler needed for steam requirements for evaporating the spent liquor is ready for service except for the installation of miscellaneous electrical equipment.

During 1952, Northern furnished 10,201,175 gal. of the spent liquor to cities, towns, and counties for use as roadbinder and expects to exceed the 15,000,000-gal. mark this year. Gallonage exceeded 2,500,000 in June alone.

Flambeau Marks 10th Year of Stream Improvement Project

The only project in the world for aerating an entire river's flow to provide adequate dissolved oxygen downstream from a sulfite pulp mill rounded out its first 10 years of existence on Wisconsin's Flambeau River in July.

The anniversary was marked by Flambeau Paper Co. In 1943, in cooperation with the Sulphite Pulp Manufacturers Research League, the firm began pumping oxygen into the river whenever the oxygen level fell below that considered necessary for healthful marine life. The required oxygen level was achieved by pumping compressed air into the stream.

The pioneer installation was tested at the firm's Pixley Dam, several miles downstream from the mill. Here, compressed air is diffused or bubbled into the water just before and just after the water wheels. A study made sometime ago by the Wisconsin Committee on Water Pollution showed that this aeration shortens by 10 miles the zone of oxygen deficiency in the Flambeau.

Badger Doubles Lagooning

Spurred on by encouraging results from its tests in lagooning spent sulfite liquor to reduce pollution of the Peshtigo River, Badger Paper Mills Inc. has nearly doubled its lagooning operation. Badger is located in Peshtigo, Wis.

For several months the firm has been hauling 50,000 gal. of the liquor daily to a basin for processing to remove the dissolved wood sugars. This has now been stepped up to a daily 90,000 gal.

As the liquor flows across the lagoon —which is located on 160 acres of sandy land surrounding a hairpin bend of the river—much of it sinks into the sand. Only during the spring thaw has the lagoon appeared like a pond. Tests of soil in the dike walls and outside the lagoon show that the fluid is greatly changed for the better as the result of chemical reactions involved in the seepage.

Barges to Substitute for Lagooning at Publishers'

Disposition of spent sulfite liquor from Publishers' Paper Co. into the Columbia River is being planned as a substitute for lagooning the stream-polluting substance during the low-water period of the Willamette River. The announcement was made at Oregon City, Ore., by Sam Robinson, vice president.

Barges equipped with large wooden tanks will be used to transport the waste from Publishers' mill at Oregon City to the Columbia, where it will be disposed. The plan has the approval of the state sanitary authority on a trial basis. Much of the summer output of sulfite liquor is used on roads and highways, being trucked from storage tanks at the mill. This disposition, however, is not sufficient to care for all the mill's production during low-water periods.

The barge plan is being tried this year for the first time. Equipment was engineered during the spring, and the first barge trip was expected about July 4. Applications have been made to the U.S. Coast Guard for permission to establish a barge basin and pipeline connections adjacent to the Oregon City mill. No opposition is anticipated, since the large basin would not interfere with normal river use.

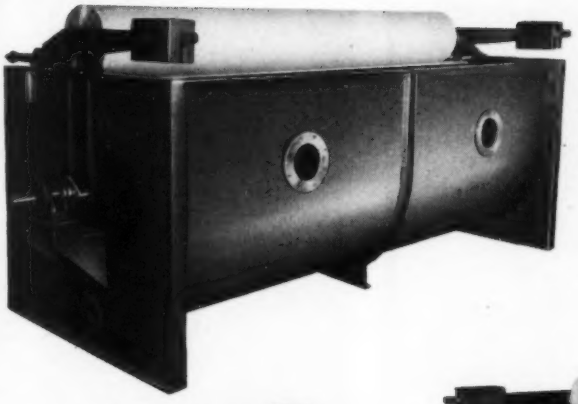
The Fort Worth Zoo

has raised a two-year-old lioness without resorting to fresh meat for feed. The animal has been fed a by-product of a Wisconsin paper mill. Torula yeast made by Rhinelander Paper Co. supplied essential vitamins and protein in the Texas lion's meatless ration. She grew faster than other lion cubs, according to zoo records, weighing 25 lb. by the time she was four years old.

Alaska Pulpwood Surveyed

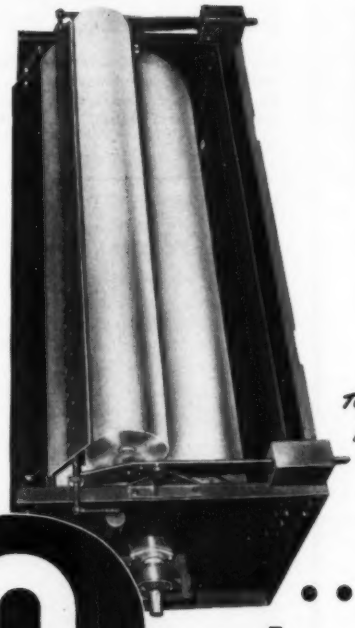
Pulpwood resources in the vicinity of Wrangell, Alaska, have been the subject of a recent survey by officials representing Pacific Northern Timber Co. of Portland, Ore. The survey, completed this spring, substantiates a favor-

ANY WAY YOU LOOK AT IT...



VIEW OF END AND INTAKE SIDE OF COWAN DECKER

VIEW OF EFFLUENT DISCHARGE END FROM INTAKE SIDE



TOP VIEW SHOWING RUBBER-COVERED COUCH ROLL AND 48"DIA.– 131" CYLINDER MOULD

...the Cowan Decker shows its superiority!

COWAN DECKER PRODUCTION FIGURES:

35 tons/day — Groundwood
85 tons/day — Sulphite
100 tons/day — Kraft

APPLETON MACHINE COMPANY
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Exclusive U.S. licensee for Cowan Deckers

R-S valv Events

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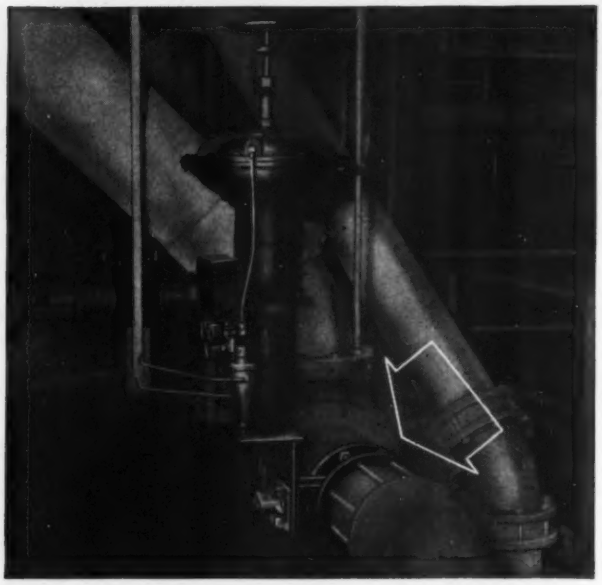

No. 677-A—1500-pound welding-end steel valve for superheated steam service. A. S. M. E. standards with heavy duty handwheel control.

R-S VALVE ADVANTAGES
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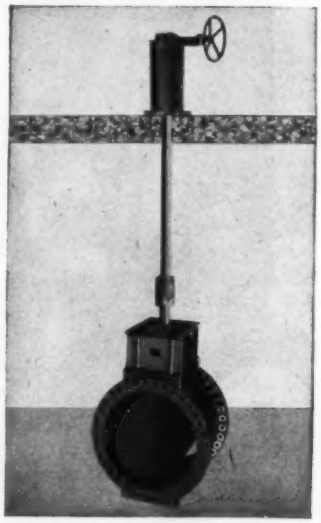

No. 864—50-pound valve equipped with rubber seat, extended shaft, thrust bearing, floor stand and heavy duty handwheel control.

Consult your local R-S Valve Engineers, or write direct.

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REPRESENTATIVES IN PRINCIPAL CITIES

able report made by timber cruisers a year ago.

Tentative plans call for a $4,500,000 chip pulp-plant and lumber plant producing a daily 75 tons of pulp chips. The plant would be located in southwestern Alaska.

Florida Smashes Pulpwood Production Record

The Florida State Chamber of Commerce has reported that the state's production of 1,583,000 cords of pulpwood in 1952 set a new record. The 1952 total was 6 per cent above 1951 and 14 per cent more than 1950.

The state ranked fourth in the South in pulpwood production last year, Georgia, Louisiana and Mississippi in the lead. The Florida pulpwood cut filled about ⅔ of the needs of the state's pulp mills. Pulp capacity of the Florida mills stood at 4,165 tons daily (15 per cent of the southern total) and will reach 4,740 tons late in 1954, the chamber said.

Alberta Kraft Mill Still Under Consideration

Plans for financing a kraft pulp and paper mill at Yates, Alberta, have been outlined in a letter to shareholders of North Canadian Oils Ltd. by Frank E. Ruben, president.

The project has been under discussion since June 1951, at which time North Western Pulp & Power Co. signed an agreement with the provincial government. The terms called for the start of construction by May 1, 1952; the capacity planned was 200 tons of pulp per day. Plant and equipment had to be in operation by May 1, 1954.

Revised terms require start of construction by October 1 of this year. A one-year extension is possible on payment of a further deposit. The firm has been given the right to reserve 2,000 sq. miles of pulpwood timber limits. It has also agreed to make certain annual payments (minimum: $45,000) and specified dues on the pulpwood cut.

It has been estimated by Mr. Ruben that the cost of the mill and the power plant (based on coal from Bryan Mountain Coal Co.) would be approximately $20,000,000. The kraft paper mill will be able to produce about 100,000 annual tons.

Gaspesia Expansion

A new four-story extension to the pulp mill of Gaspesia Sulphite Co. Ltd. at Chandler, Que., is expected to boost considerably the plant's production. E. G. M. Cape Construction Co. of Montreal is the general contractor for the structure, on which exterior work has reached completion. The unit is expected to be in production by early fall.

STURDY AND MANEUVERABLE aircraft used in the New Brunswick spraying operation as they lined up on airstrip at Budworm City

New Brunswick Attack on Spruce Budworm Declared Successful

SUCCESSFUL COMPLETION of a gigantic aerial spraying operation — the largest of its kind ever undertaken—has been announced by Norman Buchanan, New Brunswick minister of lands and mines, and Vernon E. Johnson, president of Forest Protection Ltd. The latter is a non-profit organization established to combat the spruce budworm attack on valuable timberlands in northern New Brunswick.

A total of 1,500,000 acres was sprayed by the 77 aircraft taking part; while more than 1,000,000 gal. of DDT solution were dumped in the month-long project. Five airstrips, in addition to Budworm City—used in the original operation last year, were involved in the 1953 program, which got under way May 27 and ended July 1.

The spraying covered badly infested softwood forests in the New Brunswick counties of Restigouche, Gloucester, Northumberland, and Victoria. The 1,500,000 acres treated included the 200,000 sprayed in the initial "Operation Budworm" in the spring of 1952.

The project was carried out by Forest Protection, an organization composed of representatives of four N.B. pulp and paper firms, in cooperation with the provincial and federal governments. The firms participating were: Fraser Companies Ltd., New Brunswick International Paper Co., Bathurst Power & Paper Co. Ltd., and Irving Pulp & Paper Ltd. Mr. Johnson, who headed Forest Protection, is president of New Brunswick International. General manager of FP was B. W. Flieger, who held the same post during the 1952 project.

Spot checks used

This year the spraying was carried out by planes flying in pairs spaced so that their spray swaths merged as they fell onto the trees. A different assessment was adopted for the 1953 operation, with spot checks replacing the distribution of paper squares.

The entire area to be sprayed was divided into blocks assigned to individual pilots, and as each pilot completed spraying on a particular block, he shaded it on a master map. Only two aircraft became casualties in the campaign. However, neither pilot was injured.

Wheeler Airlines of St. Jovithe, Que., a pioneer Canadian bush-flying outfit, held the prime contract. Other firms taking part were Leavens Bros. Air Service, Toronto; Skyway Air Services, Langley Prairie, B.C.; Aviation Services, Moose Jaw, Sask.; Bradley Air Services, Carp, Ont., and Central Aircraft of Yakima, Wash.

The overall plan of Forest Protection Ltd. includes the possibility of spraying another 1,000,000 acres next year and additional areas in subsequent years. The federal government has agreed to

SIGNING THE CHECK establishing the Rayonier Fellowship at Georgia Tech is James T. Sheehy, executive vice president of Rayonier Inc.; looking on during the Atlanta ceremonies are (l) Dr. Harmon Caldwell, chancellor of the University System of Georgia, and Col. Blake R. Van Leer, president of Georgia Tech; the $2,500 fellowship will be used to further the study of cellulose and the silvichemicals

contribute to the province one-third of the cost of spraying 2,500,000 acres. Entomologists have estimated that more than 3,000,000 New Brunswick acres have already been attacked by the budworm.

Forest Fire Loss in 1952 Up from Previous Year; Still Below Average

An average of more than 500 forest fires per day was reported during 1952 by state and federal agencies, according to a recent announcement by the United States Forest Service. However, Richard E. McArdle, U. S. F. S. chief forester, while deploring the nation's fire loss, declared that the record has been steadily improving over the past 10 years. He expressed appreciation for public aid in reducing fires caused by carelessness.

During 1952 a total of 188,277 forest fires was reported. While this represents an increase of 15 per cent over the 164,090 fires reported in 1951, it is well under the five-year average of 190,000 fires. Blazes averaged 210,000 yearly up to 1942, when the present nation-wide Cooperative Forest Fire Prevention Campaign was launched under the sponsorship of the Advertising Council. In 1942, for example, national forest lands showed one fire per 3,000 visitors, while in 1952 only one fire per 5,000 visitors was reported.

Fires burned a total of 14,187,325 acres in 1952, as compared to 10,781,039 acres in 1951 and a five-year average of about 16,296,000 acres. Mr. McArdle pointed out that the 1952 acreage burned would make a strip nearly a mile wide around the earth at the equator.

Airplane use increases

In discussing the 1952 fire record, Mr. McArdle declared that during the year the U. S. F. S. used aircraft for a total of 10,705 hours. The planes transported 8,148 men and carried 529,087 pounds of cargo, dropping 248,144 pounds by parachute.

The chief forester said that it is impossible to put an exact dollars-and-cents value on timber saved through the use of airplanes. He pointed out, however, that the bulk of flying time was spent in detecting and suppressing forest fires in the remote mountain sections of Montana, northern Idaho, and California, where fires will get out of control unless fire fighters get to them quickly.

More Insect Damage for Western Forests Predicted

Continued serious forest damage by the Douglas fir beetle, the Englemann spruce beetle and the spruce budworm is the 1953 outlook for the western timberlands according to entomologists of the U. S. Department of Agriculture.

The spruce budworm, in epidemic numbers in Oregon and Washington since 1949, is reported to be on the increase in central Montana and throughout the northern Rockies. In 1952 the Douglas fir beetle had infested more than 4,500,000 acres in Washington and Oregon, and if allowed to run its course the pest will probably destroy an additional 2 to 5 billion board feet. The Englemann beetle by the end of the 1952 season had infested an estimated 800,000 trees in Montana and northern Idaho; and in Colorado, where most areas have been effectively treated, there are still some regions which will again be threatened by attacks of epidemic proportions.

Cooperative effort in South

The southern pine beetle outbreak that damaged forests in seven counties of southwestern Mississippi last year is being brought under control through the cooperative efforts of government entomologists and private landowners. Survey and control activities will be continued in the infested area until the outbreak has been checked, according to forest entomologists of the U. S. D. A.

The chemical spraying of unmerchantable logs, combined with the prompt salvage and conversion to lumber of the infested timber, has been mainly responsible for effecting a striking reduction of the outbreak. By the fall of 1952 nearly 9,000,000 board feet of timber had been salvaged from southern Mississippi national forest holdings alone, and the equivalent of more than 4,500,000 board feet of pulpwood had been sold.

The entomologists also noted that while the loblolly pine sawfly infestation continues at moderate intensity in southern Arkansas, it is building up in numbers in northern and southern Louisiana and in eastern Texas.

June Newsprint Statistics

Production of newsprint in Canada (including Newfoundland) during June 1953 amounted to 463,193 tons and shipments to 486,389 tons. Output in the United States was 90,727 tons, and shipments were 89,640 tons, making a total North American production of 553,920 tons and shipments of 576,029 tons, compared with continental production of 550,995 tons and shipments of 581,929 tons in June 1952.

North American production in June was the second highest on record for the month, was only 0.8 per cent below the 1951 all-time June peak. The figures were released by the Newsprint Service Bureau, New York, N.Y.

Canadian mills produced 3,074 tons less in the first six months of 1953 than in the corresponding period of 1952, which is a decrease of 0.1 per cent. The

HAM FELTZ says:

"Don't burn out the bearings of that old machine"

Many board machines now in operation in U. S. A. are very old. They were designed to run slow. Hamilton Felts are designed to run at speeds that may burn out the bearings of slow-speed machines.

When you increase the speed of your machine, remember that the bottom felt must both transmit the power to operate the wet end cylinders and to deliver your sheet to the dryer rolls as fast as the slitters and winders can take it.

For 94 consecutive years the superintendents of board mills have learned by experience that no felts do their work better, faster or at lower cost than Hamilton Felts.

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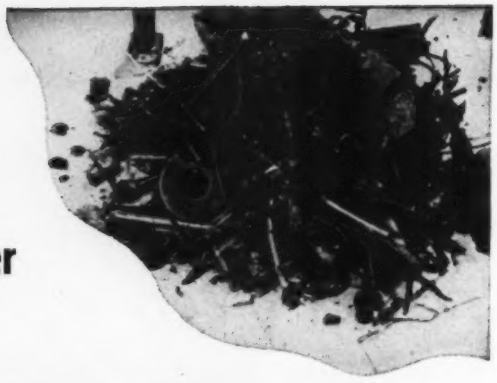

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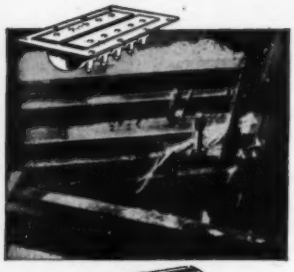
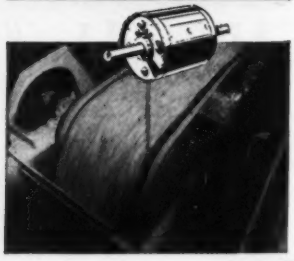
DINGS MAGNETIC PROTECTION . . .

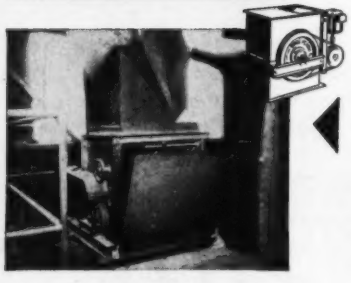


THE junk above is an actual tramp iron accumulation removed by a Dings Magnet installed in a Wisconsin paper mill . . . a rough diet for pumps, screens, defibrators and other equipment.

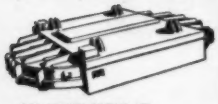


Look at the iron on this Dings Perma-Plate—a powerful non-electric magnet that can be installed in chutes, ducts, or above belts to remove iron from wood chips. Magnetic Permanence guaranteed forever. Engineering data in Catalog C-1205-A, write for it.

Fully automatic iron removal with a Dings Magnetic Pulley — used here as the head pulley on a chip belt. Iron is discharged separately from chips. Dings Pulleys are unbeatable for power, economy. Write for construction details, capacities.



Dings Non-electric Drum-type Separator installed in ductwork carrying chips separates iron automatically. Perma-Drums can be installed almost anywhere in chutes or ducts. Magnetic permanence guaranteed. Details in Catalog C-1100-A.



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PRESSURE MAGNETIC HUMP

For removing iron from liquid lines, or chutes either the most powerful rectangular magnet made, Dings RM, or a Magnetic Hump equipped with two Dings Perma-Plates. Write for Bulletin 653, and see your Dings representative whatever your tramp iron problem may be.

DINGS MAGNETS

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output in the United States was 48,977 tons, or 8.3 per cent, below that of the first six months of last year. Thus, the total continental decrease under production in the comparable period of 1952 amounted to 52,051 tons, or 1.5 per cent.

Stocks of newsprint paper at the end of June were 172,660 tons at Canadian mills and 10,211 tons at U.S. mills, making a combined total of 182,871 tons, compared with 204,980 tons on May 31, 1953, and 151,373 tons at the end of June 1952.

Kamyr Inc. Formed to Serve U. S. and Canada

Aktiebolaget Kamyr of Karlstad, Sweden, has established an allied firm in this country—Kamyr Inc. The new company is located in Hudson Falls, N.Y., and will deal in the Swedish firm's exclusive line of pulp and paper mill machinery.

Knut Dahl, son of the president of Aktiebolaget Kamyr, will serve as president of the newly formed organization. In charge of sales, design and technical detail will be Nils Klykken, who has been a resident of Glens Falls for several years. He has been associated with both Kamyr and the Sandy Hill Iron & Brass Works in the sale and engineering of large pulp bleaching plants in the U.S.

Mr. Klykken also furnishes technical assistance for pulp bleaching plants manufactured under Kamyr designs and installed in Canada. Among recent installations and sales have been those in new mills or mill additions of the following firms: Southern International Paper Co., Hollingsworth & Whitney Co., Buckeye Cellulose Corp., Brunswick Pulp & Paper Co., Allied Paper Co., and Nekoosa-Edwards Paper Co.

Kamyr Inc. came into existence soon after the first of the year and culminates almost 20 years of working relationship between the Scandinavian firm and Sandy Hill. It was in 1934 that the two companies became associated, with Sandy Hill given the task of introducing Kamyr equipment to the U.S. Paper Machinery Ltd. will continue to represent the Swedish firm in the sale and manufacture of its equipment in Canada.

Appleton Wire Turns Out 100,000th Fourdrinier Wire

The 100,000th fourdrinier wire manufactured by Appleton Wire Works of Appleton, Wis., left the assembly line July 8. The wire, more than 108 ft. in length and 264 in. wide, is to be installed at the Niagara, Wis., mill of Kimberly-Clark Corp.

Nine 50-year employees of Appleton Wire—six still working and three re-

tired—were presented $100 bills in commemoration of the event. Weaver John Brown has been with the firm since 1896, the year the first fourdrinier wire was shipped from the plant.

The initial wire went to Telulah Paper Co., now a division of Fox River Paper Corp. The second product was manufactured for Kimberly-Clark and was 81 in. in width and 40 ft. long.

In June 1953, Appleton placed in operation the widest fourdrinier loom in the United States. It has a weaving width of 288 in., and wires are now being woven for a new machine recently installed in Virginia that will require a 272-in. width.

The 288-in. loom is the 21st to be installed at Appleton since 1945. The units vary in width from 184 to 288 in. The plant now has 85 looms in operation and boasts a payroll exceeding $2,000,000 annually.

COMMUNITY NEIGHBORS tour plant of De Laval Steam Turbine Co. in Trenton, N.J., during a recent open house sponsored by the firm

Allied Notes

Hercules Powder Co.
has announced the development of a new grade of paste-fortified rosin size for the paper industry. "Pexol 240" is produced from dark rosin and, according to the firm, provides an efficient size at low cost.

Hooker Electrochemical Co.
announces the availability of 50 per cent strength liquid caustic soda from new storage and distributing facilities at Hudson Tank Storage, Weehawken, N.J. The storage capacity is more than 1,000,000 gal.

Northern Engineering Works,
Detroit manufacturer of overhead electric traveling cranes and other material handling equipment, has announced that construction has started on a 20,000-sq. ft. assembly building. The firm is also modernizing and expanding its fabricating facilities throughout the plant.

Morningstar, Nicol Inc.
has been appointed exclusive distributor to the paper industry of Pabst Brewing Co.'s new starch converting enzyme called "Amizyme." The Morningstar paper department, headed by Jerry Strasser, will assume responsibility for the sale and technical servicing of the new enzyme on a nation-wide scale.

American Cyanamid Co.
has announced that the southern regional office of its paper chemicals department has moved to new quarters at 161 St. Michael St., Mobile, Ala.

Sveen-Pedersen Sales Corp.
has moved to larger quarters at 25-36 Jackson Ave., Long Island City, N.Y.;

CARTHAGE MACHINE CO.
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Machinery for Ground Wood and Chemical Pulp Mills.
CARTHAGE, NEW YORK

MISCO
STAINLESS STEEL CASTINGS
for all equipment exposed to corrosion by sulphite acids or other corrosive agents
MICHIGAN STEEL CASTING CO., DETROIT 7, MICH.

ENGLISH ECCO CLAYS TRADE MARK CLAYS
UNIFORM • SUPERIOR • DEPENDABLE
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SODA ASH — Highly uniform; many grades. Let Wyandotte Technical Service explain how you can adapt your processes to produce your own sulphite liquor at a savings!

CAUSTIC SODA — Our liquid caustic may save you time and labor in handling, storage, use. Soda bleach foams less than lime bleaches; lowers chlorine losses, speeds draining and drying, insures cleaner finished paper with a minimum reversion of brightness.

CHLORINE — Investigate our liquid chlorine for bleaching and bleaching compounds, for direct chlorination of wood and waste paper pulps and for water treatment. Tested shipping methods assure safe delivery and trouble-free operation in your plant.

KREELON* — Wyandotte's alkylarylsulfonate is highly soluble; gives fast, effective wetting; increases absorbency of tissue and blotting paper. In proper formulation KREELON is particularly effective in deinking operations where peroxide bleach is prepared.

PLURONICS* — Mill evaluations show that PLURONIC F68, the only 100%-active flake nonionic surfactant, improves absorbency and softness of paper towels. It is an excellent paper softener, with a minimum reduction in strength. PLURONIC F68 with sulfamic acid is excellent for washing felts . . . increases felt-life as much as 100%.

PURECAL* — Wyandotte's ultra-white precipitated calcium carbonate is exceptionally uniform in quality and particle size, free of grit and abrasives, readily and easily dispersed. PURECAL produces a smooth coating of high whiteness, good hiding power, and excellent inking qualities.

CARBOSE* — CARBOSE I, added to the beater aids in deflocculation of the pulp resulting in better sheet formation. CARBOSE VL, applied at the calender stack to patent-coated board, improves grease resistance resulting in improved gloss of ink . . . when applied at the calender stack in the manufacture of jute liner, it results in an increase of 5-20% in Mullen strength.

Contact Wyandotte for skilled technical service to assist you with production, handling or storage problems. Write for data on, and samples of, chemicals for the paper industry.
Wyandotte Chemicals Corp., Wyandotte, Mich. Offices in principal cities.

*REG. U.S. PAT. OFF.

Wyandotte CHEMICALS

according to the firm, the expansion of facilities has been undertaken "to meet an increasing need" for S-P equipment.

Lockport Felt Co.
has under consideration a proposal to add to its facilities by establishing a southern branch at Starkville, Miss.

Wharton Jackson Co.,
with offices in New York, N.Y., and headquarters in Los Angeles, has been made exclusive sales agents for Huntley Industrial Minerals Inc. of Bishop, Cal. The new agency will handle a wide range of non-metallic minerals—including talc, pyrophyllite, mica, asbestos, clays and special aluminum and magnesium silicate pigments — produced from Huntley mines in California, Arizona, and Nevada.

Allied Personalities

PETER J. ABEL of Glens Falls, N.Y., for the past 18 months joint representative of Sandy Hill Iron & Brass Works and Stickle Steam Specialties Co., is now devoting his entire time to Stickle products.

A. H. HONECK has been named district manager in Cleveland and Cincinnati for Graver Water Conditioning Co. He has worked in several departments at the Graver New York, N.Y., office.

F. DIER TINCKNELL has been chosen treasurer of Chain Belt Co., Milwaukee. He has been identified with the division of finance and accounts since joining the firm in 1943.

F. Dier Tincknell

R. S. Magruder

ROBERT S. MAGRUDER has been made a salesman for Sprout, Waldron & Co. Inc. He will represent the firm in the Midwest and Middle Atlantic States. Mr. Magruder was at one time groundwood superintendent for St. Regis Paper Co. at Norfolk and Deferiet, N.Y.

K. A. ALLEN has been appointed director of national accounts for Quaker Rubber Corp., a division of H. K. Porter Co. Inc. He was formerly assistant sales manager.

Newcomb-Detroit Co. has announced the appointment of *LEONARD ALL-*

MAN as sales director for the Pulp and Paper Mill Equipment Division. Prior to joining N-D, he was associated with J. O. Ross Engineering Corp. in the New England area.

Leonard Allman

H. E. Beane

HARRY E. BEANE has been appointed vice president of sales for The Bristol Co., Waterbury, Conn. He joined the Bristol sales engineering organization in 1920. In 1947 he was promoted to the position of general sales manager.

JOHN W. BROWN has been named manager of Mason-Neilan Regulator Co.'s new district office in Seattle.

J. W. Brown

L. M. Phillips

LANGDON M. PHILLIPS, previously field sales manager, has been made assistant sales manager of Rodney Hunt Machine Co., Orange, Mass.

O. B. WILSON has been named industrial instruments sales manager for the Industrial Division of Minneapolis-Honeywell Regulator Co., Philadelphia.

O. B. Wilson

J. W. Rembe

JACK W. REMBE has been named sales manager of Rodney Hunt Machine Co., Orange, Mass. He has been export manager for the past five years.

Whittaker, Clark & Daniels Inc. of

NASH ENGINEERING COMPANY
423 WILSON AVE., SO. NORWALK, CONN

R. T. Smith

A. N. Sudduth

L. H. Niebling

W. J. Janesch

New York, N.Y., has appointed *ROBERT T. SMITH* as executive salesman; *ARTHUR N. SUDDUTH* as manager of the firm's new abrasive division, and *D. R. LEISER*, vice president of Harry Holland & Sons, as representative in Michigan.

DR. ELLIOTT J. ROBERTS of Westport, Conn., for 12 years director of research for The Dorr Co., has been promoted to the newly created position of technical director in charge of research, development and the Westport mill. He will be succeeded as director of research by *BRYANT FITCH*. Concurrently with these two promotions, *FRANK A. DOWNES* has announced his retirement as vice president in charge of research, development and the Westport mill. He is a veteran of 34 years of service with the firm.

LOUIS H. NIEBLING, formerly director of controlled materials in Midwest Piping Co.'s home office in St. Louis, has been made manager of the Chicago district sales office. *WALTER JANESCH*, St. Louis sales representative, will be Mr. Niebling's assistant.

JOHN B. CALKIN, chemical engineer and consultant with offices in New York, N.Y., has been named assistant to the president of Foster D. Snell Inc. He recently has been associated with the University of Maine, where he was director of the Department of Industrial Cooperation and secretary of the Pulp and Paper Foundation.

DEVON W. FRYBACK has been named sales manager of the eastern region for the Industrial Division of Minneapolis-Honeywell Regulator Co.

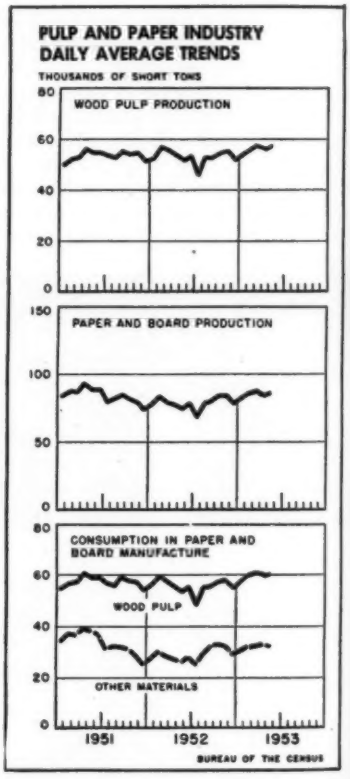
U. S. Paper and Paperboard Production

	May 1953 (tons)	Apr. 1953 (tons)	May 1952 (tons)	Total 1952* (1,000 tons)	Total 1947
Paper and Board, total	2,262,877	2,265,076	2,010,553	24,413	21,102
Paper, total	962,916	967,163	915,827	10,896	10,693
Newsprint	90,107	85,760	98,800	1,106	833
Groundwood paper (uncoated)	67,127	67,381	68,998	809	821
Printing and converting (coated)	96,968	101,504	93,937	1,096	
Book paper (uncoated)	138,896	136,818	125,378	1,482	2,208
Fine paper (writing, cover and text, bristols, thin paper and other)	112,456	111,896	115,790	1,295	1,172
Coarse paper (unbleached, kraft, glassine, greaseproof, vegetable parchment and other)	292,672	287,262	269,058	3,235	2,903
Special industrial paper	33,854	35,082	31,931	396	289
Sanitary tissue stock	99,956	109,797	87,233	1,148	894
Tissue paper	18,808	20,073	15,444	209	195
Absorbent paper	12,072	11,590	9,258	118	100
Paperboard, total	1,038,132	1,041,457	863,591	10,776	9,187
Containerboard, total	571,087	565,800	460,681	5,770	4,943
Liners	379,676	382,413	307,324	3,905	3,293
Corrugating material	161,057	154,232	130,233	1,583	1,370
Container chipboard	30,354	29,155	23,124	282	280
Bending board (folding boxboard)	294,241	297,485	256,779	2,194	2,249
Non-bending board (set-up boxboard)	74,595	76,647	58,237	687	595
Special paperboard stock	85,205	88,983	81,709	2,056	1,307
Cardboard	13,004	12,542	6,185	69	92
Wet machine board	13,671	14,090	11,832	137	150
Construction paper and board, total	248,158	242,366	219,303	2,603	2,349
Construction paper	122,158	117,206	113,596	1,298	1,277
Hardboard and insulating board	126,000	125,160	105,707	1,305	1,072

(*) Preliminary report. *Source: U.S. Department of Commerce.*

May Pulp, Paper and Board Production

Paper and board production during May amounted to 2,262,877 tons, according to a report recently issued by the Bureau of the Census. This is an approximate 12 per cent increase over the tonnage of 2,010,553 produced in May a year ago. The output of paperboard grades during the month, amounting to 1,038,132 tons, reflected an increase of 22 per cent over the production of May 1952. Paper production, amounting to 962,916 tons, registered a 5 per cent increase from the 915,827 tons produced in the same month a year before.



Pulpwood receipts at the pulp mills during May amounted to 1,874,587 cords, with consumption at 2,405,737 cords. Month-end inventories decreased almost 10 per cent to 5,062,569 cords.

Wood pulp production during May amounted to 1,508,989 tons, as compared to 1,399,602 tons produced in May a year ago.

Wood pulp inventories at the end of May at the paper and board mills amounted to 527,818 tons, showing little change during the month. Month-end stocks at the pulp mills were 173,387 tons, a substantial increase over the 158,804 tons reported at the end of April.

paper is here for good!

GUARDIAN OF HEALTH...

Paper towels have made a great contribution to better living. So have disposable tissues. It's easy to take them for granted ... but they're part of a long line of paper products that have become indispensable in a way of life. In homes, schools, offices, factories ... paper plays a paramount role ... safeguarding health, conserving time, and cutting costs. From daily experience, everyone knows paper is here *for good!*

PREPARED IN THE PUBLIC INTEREST BY BELOIT IRON WORKS, BELOIT, WISCONSIN
MAKERS OF HIGH-SPEED, HIGH-PRODUCTION PAPER MACHINERY SINCE 1858

paper is here for good!

COMMUNICATIONS...

From mail train to mail plane ... on endless flow of words! Written, printed, typed or teletyped ... on paper. Memo or magazine, letter or library ... each a link in the vital paper-chain of communications. Everyone uses paper, relies on it, benefits from it ... and generally takes it for granted. Noted or not, the positive contributions of paper are enormous. Paper, as anyone can plainly see, is here *for good!*

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SHIPPING CONTAINERS...

A work horse in every field, paper carries its share of the load in shipping, too. Special paperboard containers are tough and husky. Inside, other cartons cradle the merchandise. When there's delicate or specialized work to do, the shredded, waxed, or waterproof papers take over. Truck, train or plane ... the freight flow is smoother, safer ... because paper is here *for good!*

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paper is here for good!

BUILDING MATERIALS...

From blueprint to printed lease, paper's "construction" role in the building industry is tremendous. Millions of yards of roofing and siding paper ... countless cutbacks of wallpaper ... acres of subflooring and insulating materials involving paper in one form or another. All these help to build America and make the paper industry the sixth largest in the U. S. Obviously, paper is here *for good!*

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BELOIT

PAPER MACHINERY

CB&I Field Welding Supervisor Assures Better Tank Construction For Paper Mill Water Systems

Whenever a Horton elevated tank is erected for industrial or municipal water service, a Chicago Bridge & Iron Company Field Welding Supervisor is assigned to follow its construction. It is his job to make sure that the structure is built in accordance with the governing specifications. Here are just a few of the Field Welding Supervisor's duties that assure better tank construction at *no extra cost* to you.

- Visually inspect welds and, if necessary, indicate places for chipping and rewelding.
- Indicate places for trepanning and assist in testing and grading the plugs after they are cut.
- Supervise and check the results of any magnafluxing or x-raying required.
- Check to be sure the structure is built in accordance with the governing code used in the design.
- Witness testing of the completed tank.
- When necessary, instruct, train and qualify welding operators to assure the necessary skill and production capacity on the job.

When planning an elevated water supply for processing and fire protection at your plant, write our nearest office for estimates or quotations*.

**Includes complete CB&I Field Welding Supervisory Service AT NO EXTRA COST.*

125,000-gal. Horton elevated tank installed to provide water for processing at the Dunn Paper Company, Port Huron, Michigan.

CHICAGO BRIDGE & IRON COMPANY

Atlanta, 3 ..... 2143 Healey Building	Detroit, 26 ..... 1566 Lafayette Building	Philadelphia, 3 ..... 1653—1700 Walnut Street Building
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Boston, 10 ..... 1026—201 Devonshire Street	Houston, 2 ..... 2143 C & I Life Building	San Francisco, 4 ..... 1547—200 Bush Street
Chicago, 4 ..... 2445 McCormick Building	Los Angeles, 17 ..... 1559 General Petroleum Building	Seattle, 1 ..... 1327 Henry Building
Cleveland, 15 ..... 2267 Midland Building	New York, 6 ..... 3350—165 Broadway Building	Tulsa, 3 ..... 1651 Hunt Building

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA. In Canada: HORTON STEEL WORKS LIMITED, FORT ERIE, ONT.

Paper mill waste treatment

R. W. SIMPSON and J. J. SAMSEL
Gilbert Associates Inc.

POLLUTION CONTROL LEGISLATION has been passed by nearly every state in recent years. The federal government, through the U. S. Public Health Service, has surveyed the principal drainage basins throughout the country to determine the extent of sanitary and industrial waste pollution. There is a concerted drive underway to reduce pollution of surface water throughout the country.

The paper industry as a whole is a serious offender from the standpoint of stream pollution. With production of paper requiring from 5,000 to 90,000 gal. of water per ton, the volume of waste to be treated is high. Data published by the National Association of Manufacturers indicate that only approximately 10 per cent of the paper and pulp industry has complete waste treatment plants, while another 30 per cent has partial treatment facilities.

Every paper mill, whether located within a municipality and served by a municipal sewer system or outside municipal limits, should give serious consideration to its waste problems. Careful study of the waste discharged can result in reduction of pollution, and the recovery of water and fiber.

Methods of recovery and treatment

Over the past several years research and development work has been conducted by many pulp and paper mills, some under the direction of the National Council for Stream Improvement of the Pulp, Paper, and Paperboard Industries, for methods of recovery and treatment of their wastes. Since treatment facilities usually incur a considerable financial investment and operating costs, most work has been directed toward the reuse of the formerly discarded waste. In many cases it has been found that the recovery of the previously lost fiber and reuse of the discarded water will pay for the investment in a short period of time.

At the present time, the commonest recovery and waste treatment systems employ save-all units and standard and high-rate clarification units. The units are used to separate the fiber, clays, etc., from the white water so that the water can be reused as shower water and make-up for the beaters. The recovered fiber in most cases can be reused as furnish, except in cases where an exceptionally fine product is produced.

Before discussing the various recovery and treating systems, it would be well to mention that wastes frequently can be reduced in pollution strength and quantity by improving operations and equipment and by good housekeeping practices. In the state of Pennsylvania, the Sanitary Water Board recognized the fact that paper mills manufacturing identical products will produce varied wastes, since some mills operate more efficiently and with good housekeeping practices, while others operate less efficiently. The Board, therefore, in order to minimize as far as practical the inequality which would result if the same reduction in polluting characteristics of raw wastes were required of well operated mills as of mills less efficiently operated, summoned the Pennsylvania Section of the National Council for Stream Improvement to conduct a raw waste survey of the paper mills located in Pennsylvania. The results were then classified, and "standard" raw wastes were established for each type of mill; the required percentage of reduction is then applied to the "standard" raw wastes applicable to the type of mill, rather than to the wastes which may occur at the particular mill.

Many mills even before anti-pollution laws became effective endeavored to recover the valuable fiber which they were discharging to the stream by employing closed or partially closed systems. In the completely closed system, no white water is discharged from the mill. Most mills cannot employ a completely closed system since the total solids content builds up to a point whereby it affects the quality of the product. Usually the mill allows a certain portion of the white water to be bled off continuously with fresh water make-up to control the solids build-up. The system then becomes the partially closed system. A save-all is usually used in a completely closed or partially closed system to remove the fiber from the white water which is reused for the showers. If the fine fibers are not removed from the shower water, the shower-heads clog. Save-alls in the paper industry refer to units such as screen cylinders, settling tanks, floatation units, etc., which are used for the recovery of fiber from the white water. The Bird save-all, which is a screen cylinder type save-all, is most commonly used. The Sveen-Pedersen and ADKA floatation units are used in various systems. Actual closed or partially closed save-all systems in operation will be described in this paper.

Screen cylinder type save-all

Fig. 1 is a line diagram of a felt mill with a closed system, utilizing a Bird save-all. White water discharged from the paper machine collects in the machine pit. From the machine pit the white water is pumped to the beaters for make-up. The greater portion of the white water is pumped to a settling tank, where the large and heavy fiber settles quickly. The effluent from the settling tank is pumped through a Bird save-all for removal of the finer and floating fiber. The recovered fiber from both the settling tank and save-all unit is pumped to the stock chests and used as furnish. The save-all clarified water is used for shower water on the paper machines, with the excess pumped to the hot water storage tank from which water is drawn to the beaters and chests. During clean-up periods fiber and waste water which cannot be reused within the mill are discharged to a lagoon. Reduction in volume of the lagooned liquid is by underground seepage and evaporation.

Fig. 2 shows a similar type of system used in the recovery of fiber from a paper mill producing tissue paper. The white water from the fourdrinier machine is pumped from the machine pit, which acts as the white water collection sump, directly to a Bird save-all unit. The save-all clarified water flows by gravity to a sump and from there is pumped to a storage tank. A portion of the water is pumped directly from the clarified water sump to the machine showers. From the storage tank, the clarified water is drawn to the beaters for making the furnish. An overflow line runs from the storage tank to the river. The fiber recovered from the save-all unit is returned to the beater chest. Fresh water is used for the shower, which cannot use the partially

Mr. Simpson is chief sanitary engineer and Mr. Samsel sanitary engineer for Gilbert Associates.

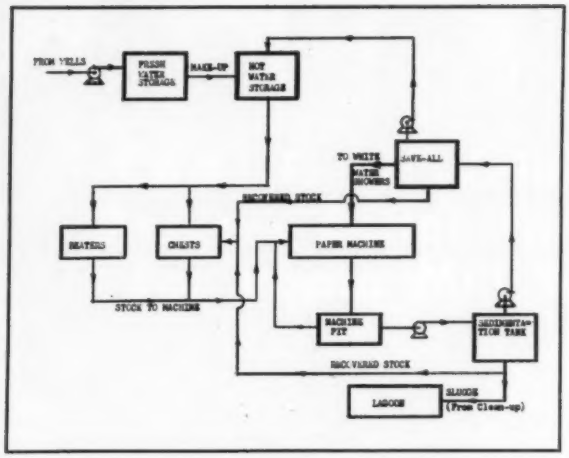
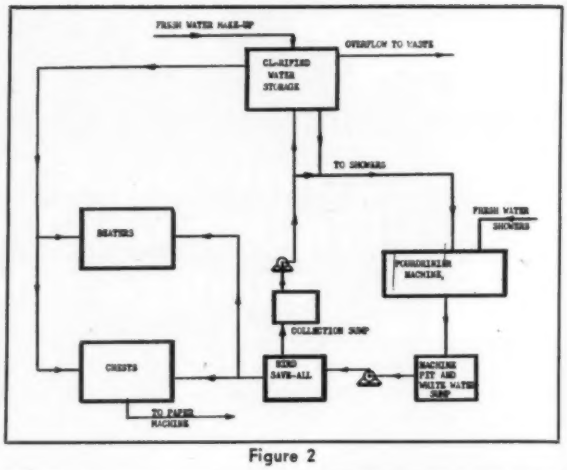


Figure 1



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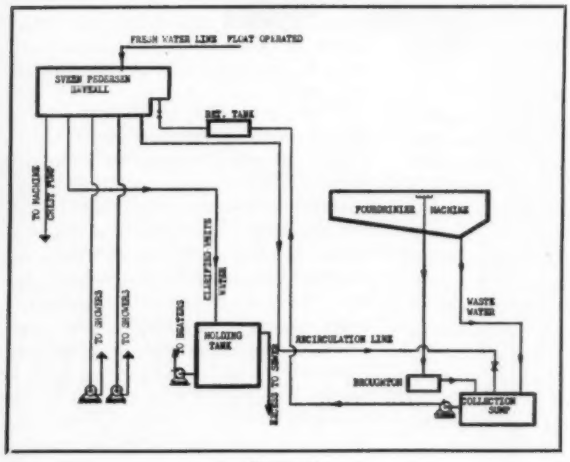
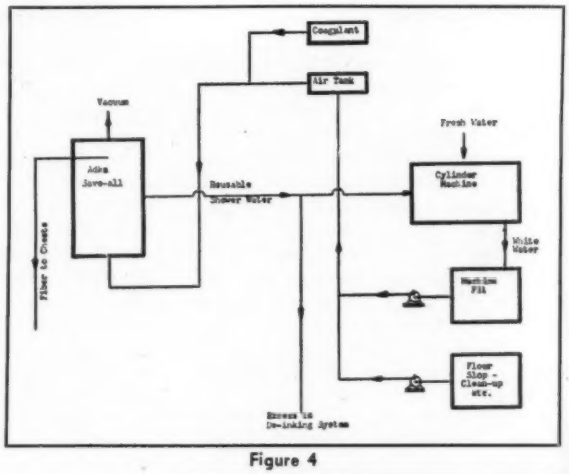


Figure 3



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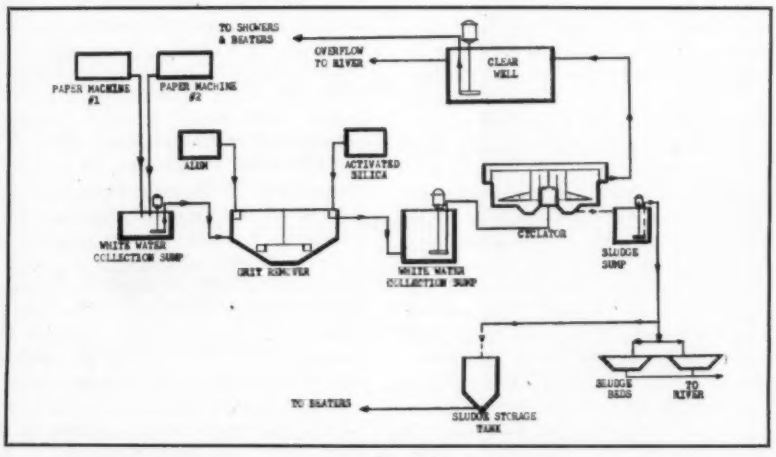

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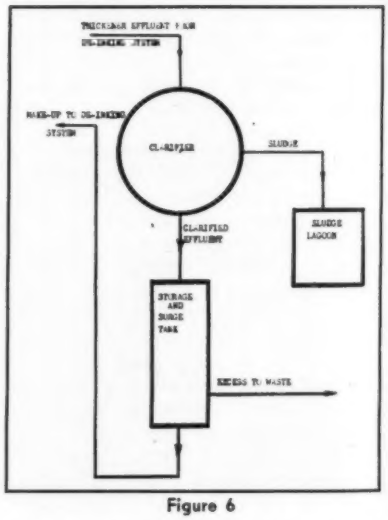


Figure 6

clarified water, resulting in the overflow from the storage tank. Some fiber loss occurs, due to poor save-all efficiency.

Flotation type save-alls

The cylinder screen type save-alls have a suspended solids removal efficiency of approximately 40 per cent, which for some mills is not high enough. A more efficient type unit with a suspended solids removal efficiency of approximately 85 per cent is the floatation type save-all. The theory of operation is based on the floatation of paper fiber and filler after aeration. Fig. 3 shows a typical installation of a Sveen-Pedersen save-all in a tissue mill. Waste water from the fourdrinier flows to a collection sump, from which it is pumped to the influent end of the save-all. Air is bled into the pump suction in order to entrain air into the water; a retention tank, located on the pump discharge line, allows the entrained air to diffuse evenly throughout the volume of liquid and surround the fibers. When the aerated wastes reach the influent end of the save-all a floccu-

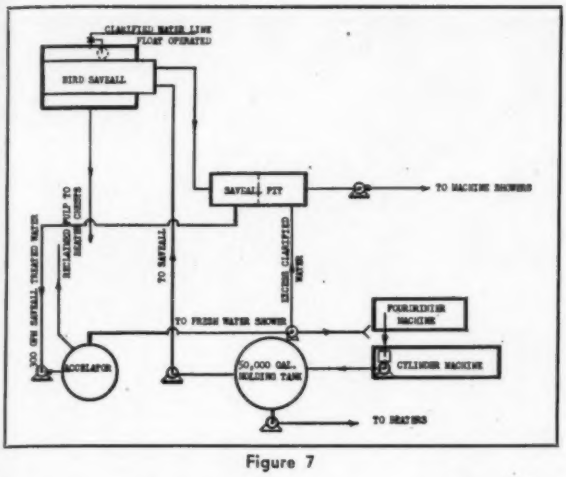


Figure 7

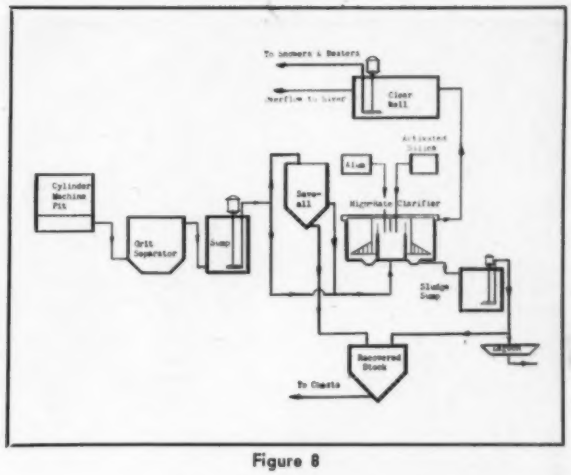


Figure 8

lating agent—either glue, alum or activated silica—is added and the waste distributed evenly across the width of the tank. As the treated white water passes into the area of low velocity, solids are lifted to the surface by the entrained air bubbles. At the discharge end of the save-all, the floated solids are scraped over an inclined plane into a stock hopper, from which they are piped to the stock chest for reuse. Clarified water is removed from the bottom of the save-all and pumped to the machine showers. Make-up water is added at the take-off box on the save-all. Excess clarified water which is not required for showers is stored in a holding tank from which water to the beaters is drawn.

An ADKA save-all, while employing principles similar to the Sveen-Pedersen unit, utilizes vacuum to assist in fiber floatation. An ADKA unit is circular, with the waste entering in the center, flowing towards the periphery. A coagulant, such as glue or alum, is mixed with the raw waste and air entrained into the waste to surround the fiber, aiding floatation. A rotating sweep moves across the surface of the unit, sucking up the floating fibers. The entire unit is enclosed, with a slight vacuum exerted on the surface of the water, inducing fiber floatation. The fiber-free water is drawn off below the surface and reused as shower water.

Fig. 4 shows a typical ADKA save-all installation, used to clarify white water from a cylinder machine. The white water flows by gravity to a machine pit, from which it is pumped through an air tank to the center of the ADKA save-all. The recovered fiber flows by gravity to the stock chests, while the clarified water is reused for showers. Since some fresh water is added to the system, there is always an excess of clarified shower water; this excess is used for make-up in the de-inking system. Even the spillage and floor wash water are received in a sump and pumped to the save-all system for fiber recovery.

High-rate clarifiers

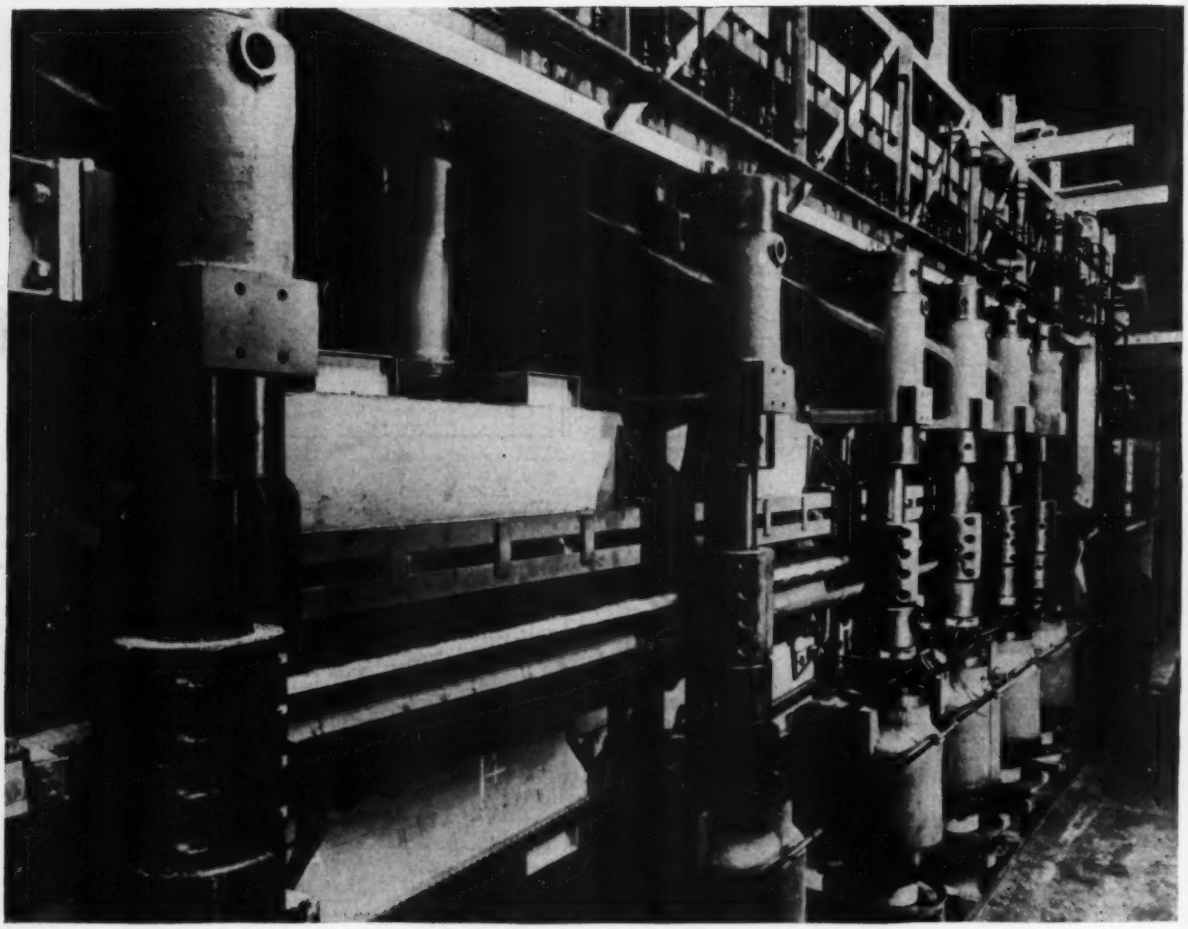
Paper products having heavy solids, such as asbestos fibers, etc., can effectively be treated by flocculation and settling. High-rate clarifiers have been developed in recent years which have taken the place of the standard flash mix, flocculation, and settling tanks. These units are now being used extensively for white water treatment. Fig. 5 is a flow diagram of an asbestos products mill which has incorporated a high-rate clarifier into its system. The white water discharged from two cylinder-type paper machines flows by gravity to a white water collection sump. From the sump, the white water is pumped by means of one or two vertical centrifugal pumps to an Infilco Vortex grit remover. The grit remover separates the silica and serpentine particles carried as impurities with the raw asbestos fiber. The white water flows from the grit remover into a collecting sump and then is pumped by means of vertical centrifugal pumps into the high-rate clarifier. The effluent from the clarifier flows by gravity into a clear well for storage. From the clear well, the water is pumped to the machines to be used for showers and also to the beaters for make-up. The recovered fiber from the clarifier is pumped to a holding tank within the building to be used for make-up to the beaters. During clean-up periods or if more recovered fiber is available than is required, the fiber is pumped to one of two sludge holding beds for de-watering. Alum and activated silica are fed to the waste to facilitate coagulation and settling.

Another system, Fig. 6, has incorporated a high-rate clarifier for de-inking waste treatment. The de-inking waste water flows by gravity to a collection tank from which it is pumped to the high-rate clarifier. The clarified effluent is collected in a storage tank from which it is drawn for wash water and make-up water in the de-inking system. The sludge from the clarifier flows to a lagoon. A satisfactory effluent for reuse in the system is obtained without the aid of chemicals; however, the unit was designed for possible future addition of chemicals, should a higher quality water be required.

High-rate clarifier in conjunction with save-all

Systems have been designed to incorporate both the save-all and the high-rate clarifier. Fig. 7 is a flow diagram of a corrugated container mill utilizing a Bird save-all in conjunction with a high-rate clarifier. Waste water from a fourdrinier and a cylinder machine is pumped to a large holding tank. Some of the water from the holding tank is drawn directly as make-up to the beaters, while the rest of it is pumped to a Bird save-all. The partially clarified waste water flows to the save-all sump from which some is drawn to the rough showers on the machines and the remainder is pumped to a high-rate clarifier. To facilitate the coagulation and settling, alum and activated silica are added. The clarified effluent is pumped back to the machines for use on fine showers, deckels, etc. The reclaimed fiber from the save-all and the clarifier is returned to the chests as make-up.

A mill manufacturing asbestos products has incorporated a similar system, except that the save-all consists of cone-shaped settling tanks rather than the screen-cylinder type. Fig. 8 is a flow diagram of the system. The white water from the cylinder machine flows by gravity to a grit collector for removal of the silica and serpentine particles carried as impurities with the raw asbestos fiber. From the grit collector the waste water is pumped to the save-all units for partial clarification. The save-all clarified effluent flows by gravity to the high-rate clarifier. Alum and activated silica are added to aid coagulation and settling. The clarified effluent from the clarifier is stored in a clear well for use as shower water and make-up to the beaters.



Technician examines pressure zone of Bartrev Press, British development that converts wood and other fibrous material into high-quality panels by a continuous and automatic process

New automatic machine makes board from wood waste

This should be a timely article in view of the general interest in the utilization of wood waste and the present trend toward a more integrated forest products industry.

A REVOLUTIONARY NEW automatic machine, known as the Bartrev press and already in operation in England, converts wood and wood wastes into high quality all-wood panels on a continuous basis. This new product, it is believed, will affect the price structure of such materials as lumber, plywood, and hardwood and should have the same effect on the wood industry as the continuous production of paper, plate glass, strip steel, and aluminum had in their respective industries.

William J. Fischbein, British industrialist, headed a team of some 200 engineers, physicists, and chemists over a 14-year research period in the course of development of the new machine. He envisioned the construction of this machine after touring the globe searching for a more efficient way to utilize the world's forest resources.

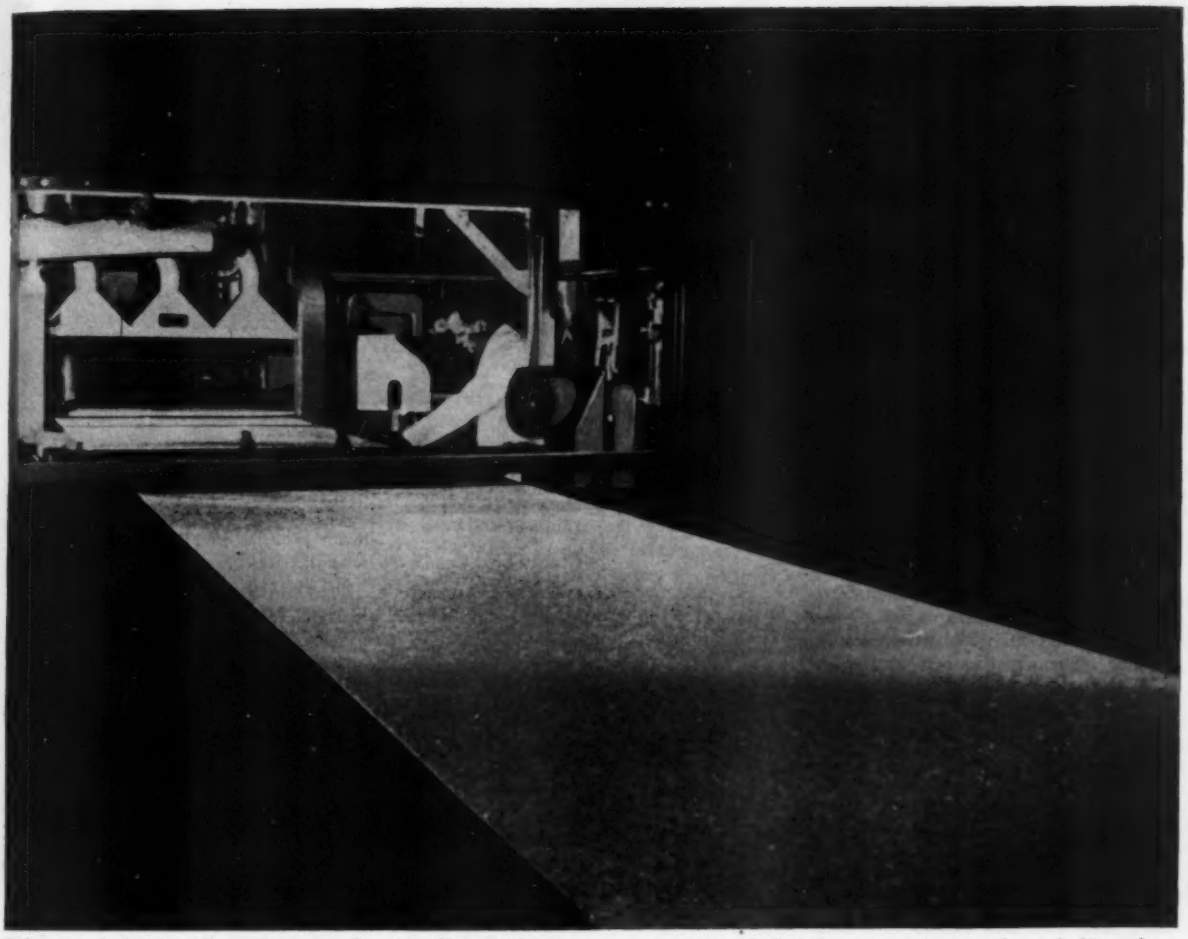
The entire undertaking, requiring more than 84,000 blueprints and architectural drawings, has the backing of the international financiers, Sassoon Banking organization.

Several Bartrev presses are now under construction for sale in the United States and Canada through the company's New York representative, Aries Fiberboard Corp., 400 Madison Ave. Price of the Bartrev press is about £615,000 (just over $1,730,000 on July 13) at the company's plant in England.

A staff of factory-trained specialists will assist in the installation of Bartrev plants in North America.

Description of press

The Bartrev press is 131 ft. long, 20 ft. high, 7½ ft. wide and weighs approximately 200 tons. Completely automatic in its operation, the press has as its component parts a hopper, a feeder, two continuous stainless steel bands each 50 in. wide, a radio frequency heating unit, devices for carrying materials to be laminated to the finished board, and an automatic trimmer and cutter. In addition to the press itself, the complete Bartrev process requires a materials preparation plant normally consisting of (depending on the raw material used) storage bins, dryers, grinders, classifiers, mix-



Delivery end of Bartrev Press, showing endless 4-ft., ¼-in. thick strip emerging at a speed of 20 fpm; processing smooth wood chip surface, the board can be cut to panels of any length

ers, feeders and measuring devices to maintain a flow of uniformly sized fiber particles. Also included are resin-measuring and blending units to provide a stock uniformly loaded with resin.

Description of process

The raw material of the process, wood, bagasse, flax shives, etc., includes a wide variety of heterogeneous materials differing in such properties as density, moisture content, shape, size, etc. The raw material plant, designed to cope with one or more kinds of raw materials, prepares stock for the continuous process of the Bartrev press.

Moisture content, which plays an important roles in the entire concept of the Bartrev process, is carefully controlled. The preparation plant is equipped with an air drier, capable of drying soaking-wet particles in less than one minute.

Quality control, maintained in all phases of the process, allows only uniform wood particles to pass through the vibrating screens to storage bins. At this point the material is automatically weighed and fed, properly proportioned, into mixers where it is blended with small quantities—4-8 per cent—of inexpensive resins.

Treated material is now evenly distributed by a special feeder to an endless 50-in. wide band of stainless steel. The steel band carries the uniform carpet of material through a radio frequency unit for pre-heating.

Emerging from the radio frequency heater, the carpet of wood particles enters the heated pressure zone of the press, where the resin is set and the actual formation of the board takes place. An opposing upper steel band meets the carpet of wood particles, and pressure exerted by six hydraulic units gradually eliminates warp-causing air pockets to form a flat, uniform panel. Finished Bartrev Board is then delivered in a continuous flow at speeds up to 30 fpm. Finally, the strip is trimmed and cut into desired lengths by a traveling cut-off saw.

The first Bartrev press, which is protected by world-wide patents, is now in continuous operation on a three-shift, seven-day week basis near London. This plant is producing at the rate of 30,000,000 sq. ft. annually.

This press, using over 50 tons daily of normally wasted wood materials, is turning out a continuous 4-ft. wood panel at speeds up to 30 fpm. With the exception of employing a "dry process," the press resembles a modern paper machine, permitting control of the weight and thickness of the product, which leaves the machine as an endless sheet.

Production area of a Bartrev plant requires less than 10,000 sq. ft. of floor space, according to the company.

Properties of Bartrev Board

Bartrev Board, a reconstituted wood panel, combines light-weight, high-strength, and an attractive smooth surface in a remarkably versatile wood material. The new panel possesses many other advantages:

1. It is low-cost, utilizing a continuous and automatic fabrication process.
2. All kinds of wood materials and other fibrous wastes can be employed in the production of Bartrev board. Both wet and dry resins can be used.

Specially engineered bearings provide almost friction-less and vibration-free movement for Bartrev Press while in operation

Wood chips move along conveyor to press; machine is the first to produce high-quality panel material for as little as 3 cents per sq. ft.

Board is versatile and can be easily drilled, planed, chiseled and rabbeted (as shown) with ordinary woodworking tools

3. It is fixed in only one dimension—maximum width—which is set by the width of the press. The length is continuous. The panel density and thicknesses, ranging from 3/16 to 3/4 in. are automatically controlled.

4. It is flat and warp-resistant. Bartrev panels are also uniform in quality because all phases of the continuous production are controlled and automatic.

5. A low-cost core material for wood veneers and plastic laminates like Formica can be made.

6. Decorative papers, textiles, metal foils, laminates, etc., can be bonded directly to Bartrev Board during the manufacturing process.

7. Properly treated, Bartrev Board can be made fire-retardant and pest-resistant.

8. The material can be sawed, cut, bent, screwed, nailed, drilled and jointed with ordinary woodworking tools.

The new board is said to have more than 3,000 industrial applications and may become a standard structural material in several major industries.

In the building industry, Bartrev Board can be used for low-cost pre-fabricated home construction. As a panel material, it is easily worked, economically handled in large sections, and has good structural strength.

Easily veneered, the board makes a low-cost decorative wall panel. For use in sliding, cabinet and flush doors, the material is dimensionally stable and of light weight. Properly treated, Bartrev Board can be used for flooring with or without facing.

When used in store fixtures, display pieces, and motion picture and television stage settings, Bartrev Board offers the advantages of low-cost and large-sized panels.

In furniture manufacturing, the new panel can be worked as easily as high-grade lumber or plywood. Its high compressive strength and uniformity provide an excellent core stock for veneers and high-pressure plastic laminates.

Faced with many kinds of metal sheeting, Bartrev Board provides automotive manufacturers with a durable, highly puncture-resistant and economical lining and truck body material.

The psychology of industrial accidents*

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THE PROBLEM of industrial accidents is a good illustration of the benefits that arise when two such fields of human endeavor as industrial management and psychiatry meet. It also may serve as a good illustration of the limitations that exist.

It would seem that a psychiatrist could make his most valuable contribution to industry if he were considered, and would consider himself, as a person interested in helping industry to think through some of its problems as far as these relate to the broad field of human relations.

When we ask ourselves to define accident, we immediately begin to realize the difficulties we are up against. Strictly speaking, an accident is a mishappening due to circumstances beyond one's control. But is it? Are we not always, or almost always, dimly or clearly aware of what we like to call the "human element". In other words, are we not of the opinion that we, ourselves, have something to do with our accidents? For instance, although we usually consider the blowout of a brand new automobile tire as an accident beyond one's control, one might also reason that, if the driver would have inspected the tire more frequently, the accident could probably have been prevented. On the other hand, we also realize that such excessive preoccupation with the tire would interfere with

*Abridged from a paper presented at the joint fall meeting of the Southern and Southeastern divisions of the Superintendents Association.

the goal of smooth and speedy automobile travel. Such reasoning demonstrates that simple accidents are not as uncomplicated as the proverbial brick which just falls on one's head.

We all know that we have "bad luck days," on which we may have several minor or even major accidents. A worker, for instance, who is recovering from a severe physical illness, or who has a hangover, or who has worries about financial or family problems, is generally considered to be more prone than usual to have accidents. In other words, things going on in the backs of our minds influence the things that we can do or fail to do in relation to accidents.

Accident proneness

First, there is the often-mentioned small group of individuals who are habitually accident prone. I shall not discuss this group beyond mentioning that individuals in it have certain attitudes which contribute towards and make for accidents. To the deeper parts of their minds, these accidents have certain definite meanings; and, incredible as it may seem, certain advantages.

The second group is made up of persons not habitually prone to accidents. Rather, they are only temporarily so. Most of us belong in this group. Here, disturbing emotional events and experiences may lead to an increased number of accidents. These events and experiences may not necessarily concern the job; they may have to do with one's private life.

On the other hand, important goings-on that exist in the job situation, which might not necessarily meet the eye at all, may also make an individual more accident prone.

Why is it, in spite of intelligent and well-enforced safety precautions, that accidents may occur frequently on a certain job situation? Why is the work atmosphere in some departments of an industrial organization conducive to frequent accidents in spite of all possible precautions?

It is not possible to give an all-conclusive explanation for such happenings. However, there is a most important aspect of this disturbing pattern of events.

Safety instructions misinterpreted

You all know the story of the man who was found smoking under the "No Smoking" sign; and who defended himself by saying that the sign did not say "Positively No Smoking."

What is going on in such a common situation? The sign had an apparently unmistakable communication to the worker. It told him to use a certain safety precaution: namely, not to smoke. Yet, such a communication is not as clear cut as it seems. For instance, the worker, depending on the general job situation and on observations made in the past, may have received an entirely different, indirect communication through this sign. His communication may have been: "The management has to put up this sign because of a clause in the fire insurance policy. We have been told by the insurance agent that this clause is obsolete and will be dropped with the renewal of our policy. It is really all right to smoke, but we have to keep this sign up."

In another case, the worker may have believed the communication to mean that smoking is forbidden to the workers but is permissible, under certain circumstances, to the management. Therefore, he concludes that the sign does not necessarily imply a true safety precaution.

Again, depending on the situation, the sign may communicate to the viewer that as much as lighting a match will blow the whole building up, and that it is to the worker's best interest not to smoke.

The point is that in safety instructions there are two types of communications going on between management and worker. One type of communication is the obvious—"It is in your own interest not to get hurt." The other type of communication is the less obvious and often the more important. It may reach the worker by what may be called the "atmosphere" surrounding the instruction.

To explain, in a certain industry safety shoes are worn on certain types of jobs. Management tells the workers that they wear these shoes on those certain jobs for their own protection and in their own interest. The reaction of a worker, as far as he is aware of it, to these instructions is one of agreement, cooperation and decision to wear the shoes. For what reasons, then, might there be an unduly large number of workers injured in accidents on such a job situation because they had forgotten to put on their safety shoes?

I believe that a large part of the answer to this question lies with the nonspoken or indirect communication that was transmitted behind the direct communication about safety shoes. Such a communication, let us say, transmitted by a foreman responsible for safety precautions in this department, may have been something altogether different from the direct communication. For instance, because of his personality makeup, the foreman may have communicated indirectly to the workers that he enforces the safety shoe ruling because, "Father knows best," or "You do this because I say so," or "I must have no accidents in my department because that would be a black mark against me."

In the back of the mind of a worker in a situation of this kind may be such a thought as, "This is just another way for them to push me around," or "They really don't care at all about my hide but only about their own." If feelings of this kind against a foreman or a group of superiors in a department or an organization is very strong, unconsciously the workers will get the thought in the back of their minds that "it will serve them right if I have an accident."

These simple illustrations demonstrate the conviction of specialists in the field of human relations that very startling and contradictory events are going on in the backs of our minds. Psychiatry has ample proof for and knowledge of the reason why at times we may be our own worst enemy.

When it comes to remedies, no simple or easy prescription can be had. Problems having to do largely with our feelings and with the complicated goings-on between people are not easily fitted into any kind of formula. They are solved only by hard work.

Improved communications required

Many of the difficulties of industry are due largely to inadequate and obstructed communications within departments, between departments, or possibly between top management and the rest of the organization.

We are all familiar with a department or an organization which may be functioning very well and smoothly because of the thorough understanding by each person working in it of the attitudes of the others. This condition does not necessarily mean an absence of disagreeable or difficult attitudes in some individuals. Rather, it means that such difficulties are not denied, but are acknowledged openly and perhaps are even discussed. In a department of this kind there definitely is adequate communication. On the other hand, you know of some departments or organizations of which one would then say: "They don't seem to be able to get together on anything. Everybody has bad feelings and the general atmosphere is bad." Consider them as examples of inadequate communication.

Improvement of communication is obtained by learning more about what is going on between oneself and the other fellow; and to bring into one's mind and, if necessary, into occasional discussion the emotional events and problems between the people in an organization. Such an approach to human relations does not introduce a new factor into industry. It merely emphasizes, as "industrial psychiatry" is doing, an element basic to industry and to all other similar organizations—the place where a person spends one-third of his adult lifetime cannot be likened to the impersonality of a machine, but rather to something that is profoundly human. Awareness and acceptance of the humanness of industry undoubtedly will improve industrial relations in many desirable ways.

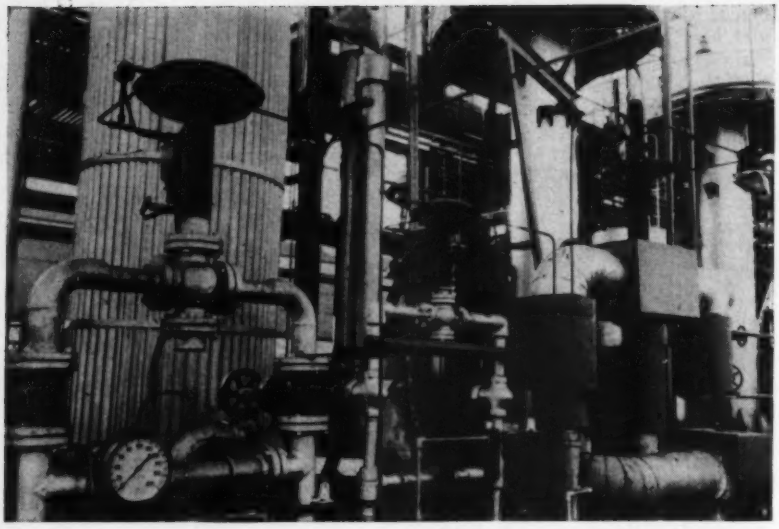

Fig. 1—Electro-pneumatic relay installed on Hammel-Dahl valve

Future plant robotization in the paper mill... the use of instruments

LEO WALTER*

IN THESE DAYS OF rapid developments in plant equipment and instrumentation—particularly in automatic process control—certain trends are clearly emanating in all branches of industry, namely robotization. The new graphic control panels, as made by most of the prominent instrument manufacturers, can and probably will bring decisive improvements in pulp and paper production on a grand scale. Let us see what has been done, and which problems in pulp and paper manufacture, whether chemical, mechanical, or thermal, could be solved better by graphic panels. Close cooperation between mill engineers and instrument designers should introduce fully automatic remote plant control into manufacture of pulp and paper.

Controllability and plant design

Before remote supervision and fully automatic control can be introduced in a pulp and paper mill, the "controllability" of the plant has to be ascertained. Designers and users of plant equipment must work together to make plant equipment controllable and flexible enough to follow quickly and precisely any control action initiated on a graphic control panel. The plant equipment may be a single apparatus, or it may consist of many machines, but it must have one inherent quality in any branch of industry—to be efficient in operation, and that is "controllability." The average designer does not always take this most important design factor into consideration when developing a new piece of machinery or apparatus for the processing of goods. Naturally, he looks first into the question of working conditions in general, materials to be used in design, required maximum output, general plant layout, and the many other factors which influence the design of new plant, and he usually considers controllability last. This is wrong and leads in the end to either difficult hand control of the piece of equipment; or, if automatic process control is attempted, this oversight on the part of the designer makes the use of elaborate and costly automatic control gear necessary.

Let us elaborate a little and take a few practical examples in order to stimulate consideration of controllability when designing new plant equipment.

Process variables and control

Each control problem can be regarded as some form of action or reaction, which must be counter-balanced by the control instrument in order to achieve balance within the process. For example, in a thermal process, a drop of temperature must be counteracted by increased heat input. An increase of steam pressure in a pipeline has to be counteracted by the action of a reducing valve or pressure regulator. Increased condensation in a chemical reaction must be balanced by adding more liquid for dilution. Humidity control keeps the moisture-content of air within a room constant by adding or removing water vapor to the incoming air.

Action and reaction follow each other in order to keep a certain quality or quantity constant, when it is desirable to maintain a condition free from variations during the whole process. On the other hand, some chemical processes require pre-determined variation of a certain process quality; for example, rise and fall of temperature following a time-temperature curve. Time-cycle controllers have been developed to meet this demand.

These examples deal with process "variables," which is the general expression for controlled media or quantities such as pressure, temperature, rate of flow, etc.

Electrical quantities, velocity, consistency, alkalinity or acidity, humidity, speed, and other physical properties can be process variables. Among the variable properties of chemical processes are chemical composition, density, viscosity, electrical conductivity, and many more.

A process may be either a batch process, where a certain quantity of materials is involved, or a continuous process, where materials flow into the plant equipment and leave in a continuous stream at the same rate.

Process analysis

It is generally necessary to analyze the process when attempting to apply auto-

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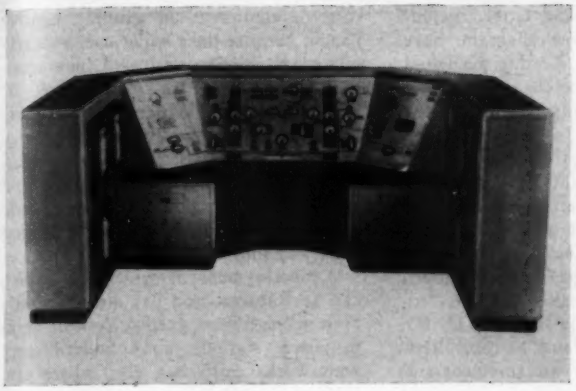

Fig. 2—Elliott graphic control desk

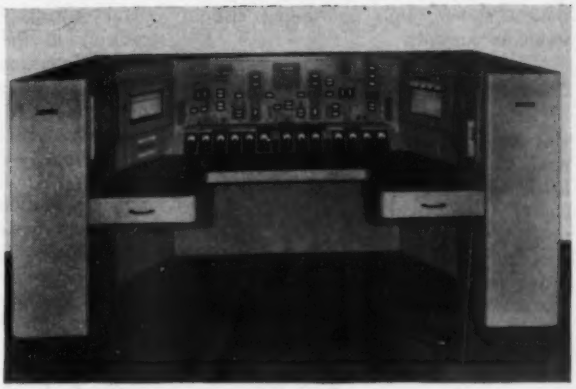

Fig. 3—Controller graphic control desk

matic control, first by examining its mechanical, physical and chemical properties, and afterwards by eliminating all those process variables which are of no importance to the special control problem. A process contains a number of variable properties which can be independently controlled, and also other properties which are dependent on them. For example, pressure and temperature of saturated steam are dependent on each other, and so are viscosity of oil and its temperature. Similarly temperature and composition of a liquid determine its density and pH.

By first eliminating from observation all properties which have no influence on the control problem, the application of automatic control can be analyzed in a simpler way. The simplest problem is automatic control of an "independent" variable, e.g., liquid level. In general, for instance, it makes no difference to a level controller if the temperature of the liquid in the vessel varies slightly. Temperature can therefore, be eliminated from analysis right from the start.

On the other hand, some process properties may be closely interlocked, are all dependent on each other, and controllability depends on a multitude of factors, partly of plant design, partly of operation.

Origin of supervisory instrument panels

The demand for measuring and controlling means concentrated in a comparatively small space came first from the oil industry. Discovery of catalytic oil cracking involved in practical application the use of a great number of industrial indicating and recording instruments for measurement and/or control of such process factors as pressures, temperatures, liquid level, rate of flow, liquid density, acidity or alkalinity (pH), and others.

The desire of plant engineers in many branches of industry has been for many years to "robotize" the plant by using centralized supervision and by means of automatic control instruments, which can be adjusted and checked and which are capable of being assembled on a remote centralized control instrument desk. This dream has come true for the oil and heavy chemical industry, where one supervising control engineer sits on a central graphic panel and can perform the following duties, leaving very little to do for the plant operators themselves: (a) supervising all plant measurements on miniature indicators or recorders centralized in one panel; (b) re-adjusting automatic control receiver-indicators or controllers in the graphic flow sheet, and (c) in case of emergency to cut out automatic control, and to run the process or part of it on hand control without leaving the central control desk.

The two main groups of instruments used for remote supervision and control are either mechanically or electrically operated control instruments. The main representatives of each group are (1) mechanical power operated, using air or water under pressure; (2) electric and electronic designs. Development in England has been and still is, producing electronic instruments, due to their small instrument time lags and other advantages claimed by their makers over mechanical instruments. Development of the latter, however, has not been neglected, and new pneumatic control instruments have been designed, making adjustment, or switch-over from automatic to manual control, easy. It can, however, be stated that in England, and on the European continent, introduction of electronic instruments is proceeding more cautiously than in America, but many leading instrument makers in England have today in their instrument range some electronic types available.

Electronic instruments obstacle

One obstacle in the use of electronic instruments for automatic process control seems to be the fact that electrically operated larger control valves, which can be very accurately positioned, are still under development, both in the U.S.A. and England. Electronic controllers have, therefore, still to use pneumatically operated control valves, and electro-pneumatic convectors have to be installed in the control circuit (Fig. 1).

Progress made in transmission of measuring or controlling impulses and values over long distances has been rapid during the last years, and a great number of pneumatic or electric "telemetering" systems are now widely used. The transformation of standard receiving control instruments for telemetering into much smaller indicating or recording units, as used in the new compact graphic panels, was, however, not an easy job for the designers. After years of research new miniature control instruments have now been produced which can be inserted into a flow sheet, thus not only making supervision of control easier, but also saving considerable space.

Supervisory panel control

In the case of the automatic control room, before a supervisory control desk or panel (Fig. 2) could be evolved, a simple and universal miniature indicating and controlling instrument has to be developed. Numbers of these instruments could then be located in close proximity to each other and embodied on a supervisory desk or display panel. Where a complicated process has to be controlled, control instruments could be linked by a flow diagram which would illustrate clearly the function of each control in the process.

The various quantities to be measured and controlled (e.g. flow, pressure, liquid level and temperature) are converted to electrical or pneumatic signals by means of a range of transmitters, which can be mounted either at the measuring point or at the control station. The choice between electrical and pneumatic transmitters rests on a number of factors, such as cost, explosion hazard and length of transmission line. Generally speaking, pneumatic transmitters are used in graphic control systems for all quantities except where very long transmission lines would introduce serious lags into the

control system, thus demanding electronic instruments.

Control valves

Diaphragm control valves are available for graphic panels for almost every application. Sizes from ½ to 8 in. are being made, and inner valves of V-port, characterized V-port, parabolic plug and proportional uniform percentage can be supplied in all sizes. Valve positioners or pilot relays ensure that the pneumatic control valve operates accurately at any output air pressure from the control mechanism. In an electronic-pneumatic system, where electric control impulses have to be converted into varying air pressure, diaphragm control valves with converter relays can be used.

The "Centroller"

The "Centroller" graphic control desk (Fig. 3) has been developed in England as a self-contained electrically operated control unit for centralized operation of a chemical process plant. The unit can have the form of a control desk or console on which are mounted a multitude of automatic control instruments and recorders necessary for the efficient operation of the processing equipment in the plant. Mounted on the unit is also a mimic diagram containing a number of miniature edgewise indicating instruments inserted into the diaphragm at the appropriate points of measurement and/or control. For the latter, the instruments in the flow diagram have double pointers, one indicating the actual measured value, while the other shows the set point. All measurements on the plant are transmitted to the "Centroller" in the form of electrical detecting signals (or small D.C. currents), thus permitting the use of multi-pen recorders and of the various miniature repeat indicators inserted in the diagram.

The "Centroller" has been developed by the instrument makers in close cooperation with Anglo-Iranian Oil Co. Ltd., as users. It contains 13 controllers, of which five are for measurement and control of rate flow and six for liquid level. Further, there are three six-point multi-pen recorders, and one multipoint indicator for temperatures, and 25 miniature indicators show the levels and pressures in various columns and chemical vessels and indicate the rate of flow in pipes, re-boiler temperatures, etc. Indication is given by miniature edgewise indicators of what is going on in the plant, and these small instruments form part of the mimic flow diagram. Duplex indicators are used where the measured quantity represents the desired value (set point) of the controlled process variable, and the second pointer clearly showed the result of automatic control.

Future developments

It is somewhat difficult to foresee future developments in graphic control panels, because their wider use is closely related to developments of new continuous processes for manufacture of goods on a very large scale. Very big oil refineries will be followed by large chemical plants, using continuous processes in place of batch processing, and there can be no doubt that more and more graphic control panels will find their way into manufacture of paper.

A development of wider use, which can be foreseen, and has already partly been achieved, are graphic control desks in power stations, large boiler-houses, waterworks, gasworks, etc., where centralized control is important. The use of a color identification scheme for the flow sheet is already in operation in the U.S.A., and for example the "Colorgraphic" control panel has been developed by one of the prominent American instrument makers. Obviously the use of a definite color for each controlled medium, such as steam, water, air, liquids, gases, etc., makes supervision throughout a plant more effective. By masking pipelines, valves and other fittings in a specific color, and by using the same color in the graphic flow sheet and for instrument pen records, identification is made easier.

The ultimate cost price of centralized graphic control panels can be brought down to the installation cost of large standard panels and should be no deterrent to wider use of graphic panels.

Centrifugal Pumps

IGOR J. KARASSIK and ROY CARTER
Application Engineers, Worthington Corp.

Priming

Part 25 of a series

PRIMING A CENTRIFUGAL PUMP means the removal of the air, gas or vapor from the waterways by filling these spaces with the liquid to be pumped. This can be done manually or automatically depending upon the equipment and controls used.

Venting with suction head

When first put in service, the waterways of a centrifugal pump are filled with air. If the suction supply is above atmospheric pressure and the suction valve is opened, this air will be trapped in the pump and compressed to some extent. Unless the suction pressure is high enough to compress the air so that the suction waterways and the eye of the impeller are filled with water, the pump will not be primed. With a positive suction head on the pump, priming is accomplished by venting the entrapped air out of the pump through a valve provided for that purpose. If the pump takes its suction from a supply located below the pump itself, the air in the pump must be evacuated by some vacuum producing device, a foot valve must be provided in the suction line, or a priming chamber provided in the suction line.

Foot valves

Foot valves were commonly used for early installations of centrifugal pumps but now, except for certain types of applications, are relatively little used. A

Material from this article will be included in a book on centrifugal pumps now being prepared by the authors; hence, all rights to republication are reserved by the authors.

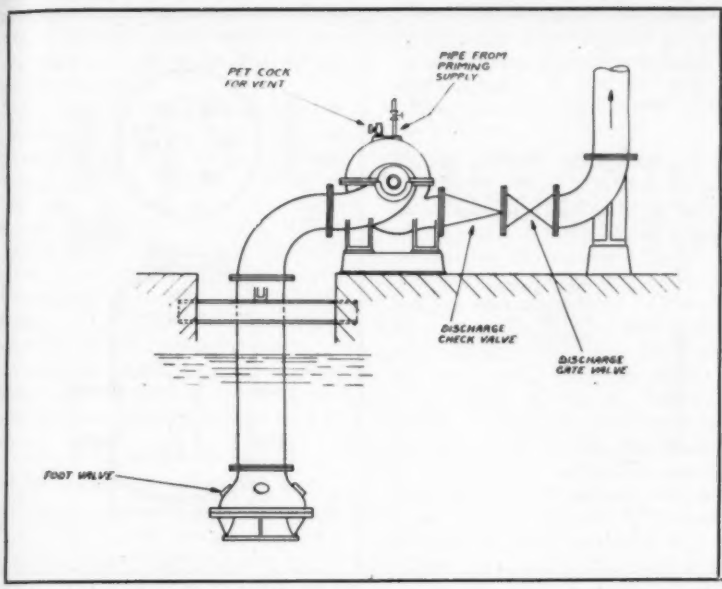

Fig. 1—Typical installation with foot valve

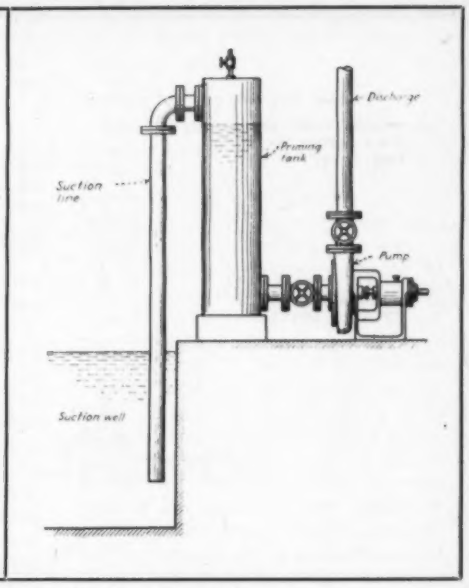

Fig. 2—Simple priming tank

foot valve is a form of check valve installed at the bottom or foot of a suction line. Like a regular check valve, its purpose is to allow flow in one direction only, that is, towards the pump. When the pump is stopped, the ports of the foot valve close and, if it seats tightly, the water cannot drain back to the suction well. Unfortunately, a foot valve does not always seat tightly, so the pump occasionally loses its prime. In such a case, the rate of leakage is generally small, and it is feasible to put the pump into service by filling it and starting it promptly. Foot valves should not be used for liquids containing foreign material.

A typical installation of a pump with foot valve is shown in Fig. 1. The pump can be filled with water through a funnel attached to the priming connection or from an overhead tank or other source of water. If a check valve is used on the pump and the discharge line remains full of water, a small bypass around the valve permits using the water in the discharge line to re-prime the pump if the foot valve has leaked.

When the discharge head is low, the discharge check valve is often eliminated and the foot valve acts as a check valve to prevent reverse flow through the pump. As most foot valves are designed for relatively low pressures, the use of a foot valve as a check valve for the system is not generally practicable with systems having a high discharge pressure. In such an installation a discharge check valve is necessary, but there is always the danger that the check valve will not seat tightly while the foot valve does, thus subjecting the foot valve to the static discharge pressure.

On a system where the water can drain out of the pump through the discharge line when the pump is shut down, it is necessary to have a discharge gate valve which must be closed when the pump is to be stopped and opened after it is started.

Priming chambers

A priming chamber in its simplest form is a tank with an outlet at its bottom at the same level as the pump suction nozzle and directly connected to it and with an inlet located at the top of the tank to which the suction line is connected as illustrated in Fig. 2. The size of the tank must be such that the volume contained between the top of the outlet and the bottom of the inlet is roughly three times the volume of the suction pipe. With a priming chamber, leakage of air while the pump is shut

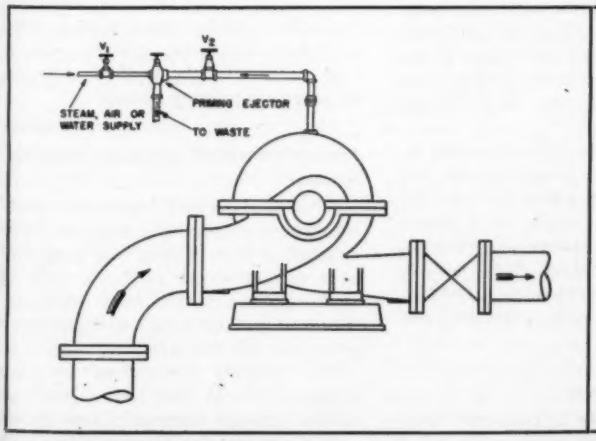

Fig. 3—Arrangement for priming with an ejector

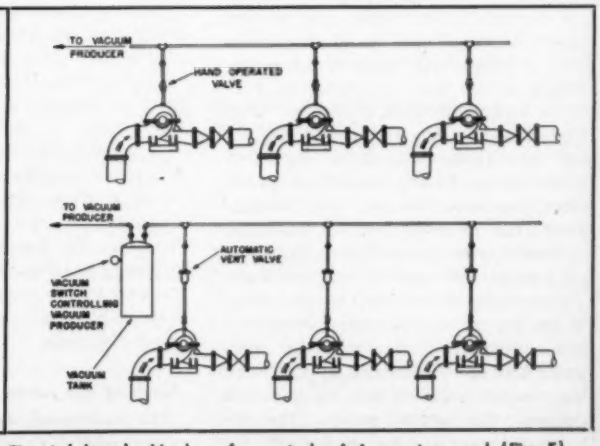

Fig. 4 (above)—Hook-up for central priming system, and (Fig. 5) for central automatic priming system

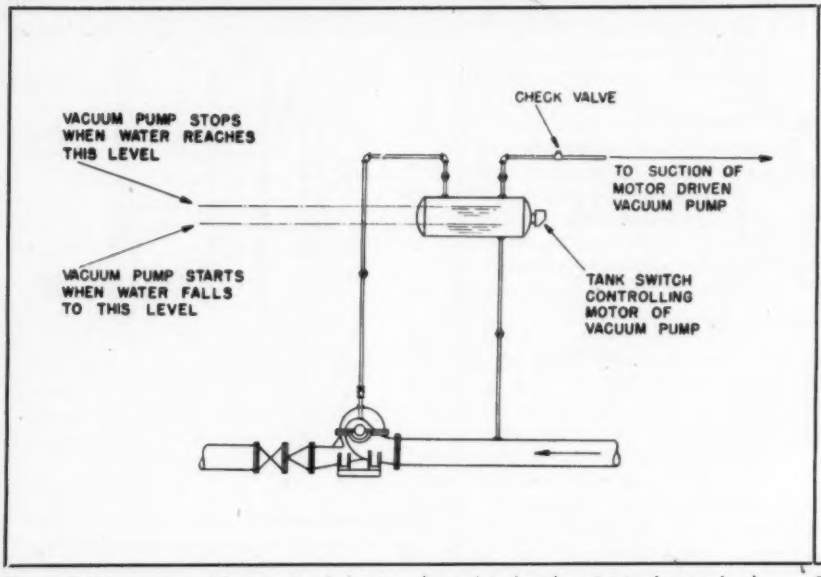
CHECK VALVE
VACUUM PUMP STOPS WHEN WATER REACHES THIS LEVEL
TO SUCTION OF MOTOR DRIVEN VACUUM PUMP
VACUUM PUMP STARTS WHEN WATER FALLS TO THIS LEVEL
TANK SWITCH CONTROLLING MOTOR OF VACUUM PUMP

Fig. 6—Priming system without vent valves using elevated tank with maintained water level

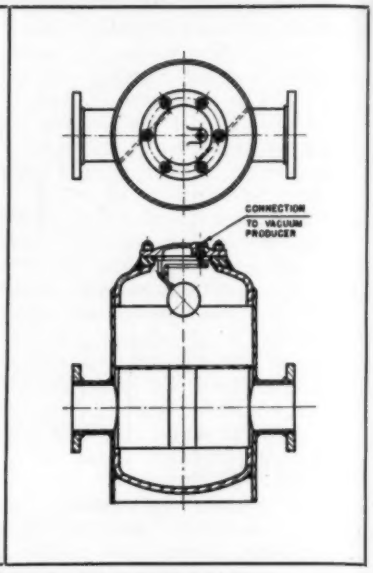

Fig. 7—Air separating chamber for 4 to 12-in. suction lines

down may cause the liquid in the suction line to leak out, but the liquid in the tank below the suction inlet cannot run back to the supply. If the centrifugal pump is then started, it will pump this entrapped liquid out of the chamber, creating a vacuum in the tank, and the atmospheric pressure on the supply will force the liquid up the suction line into the priming chamber.

Certain precautions in the design must be taken to prevent syphoning when the unit is shut down. Except in special cases, it is more advantageous to buy a commercial priming chamber, with proper automatic vents and other features, than for the user to attempt to make his own design. The use of priming chambers is restricted, because of their size, to relatively small pumps.

Type of vacuum devices used

For systems in which pumps are primed by evacuating the air, practically every commercially made vacuum producing device can be employed. Formerly water and steam jet primers were applied widely but, with the increase in the use of electricity as a source of power, motor-driven vacuum pumps became popular. The wet type vacuum pumps are most favored for manually controlled electrically driven units, as no damage will result if slugs of water are carried over into the vacuum pump. When dry vacuum pumps are employed, some protective device must be interposed between the centrifugal pump and the vacuum pump so that water cannot get into the vacuum pump. The dry vacuum pump is used extensively for "central priming systems."

Ejectors

Priming ejectors work on the jet principle using steam, compressed air, or water as the operating medium. A typical hook up for priming with an ejector is shown in Fig. 3. Valve V_1 is opened to start the ejector, and then Valve V_2 is opened. When all the air has been exhausted, water will be pulled over and will be discharged by the ejector. When this occurs the pump is primed, and valves V_2 and V_1 are closed in that order.

Dry and wet vacuum pumps

Dry vacuum pumps, which are made both in the reciprocating and rotary type, are designs which cannot handle mixtures of air and water. When used on priming systems, the system has to be arranged so no liquid can get to the vacuum pump.

Any rotary, rotative, or reciprocating pump that can handle air or a mixture of air and water is classified as a wet vacuum pump. The most common type used in priming systems is the Nash Hytor type.

If a solid stream of water comes to this pump in place of air or an air and water mixture, the pump will not be damaged, but will require more power to drive. For this reason, in automatic priming systems using this type of vacuum pump, a separating chamber or trap is provided so the water will not reach the pump.

Point of air removal

In most cases, air is exhausted from a centrifugal pump when it is being primed through the high point of the volute. Generally, it is possible to start a centrifugal pump if the liquid covers the eye of the impeller and wash out the remaining air entrapped in the casing by the flow of liquid through the pump. On some units the priming is accomplished solely from the high point in the suction waterways, while on other units, notably large sizes, air is exhausted both from the high point of the volute and the high point or points of the suction waterways.

Central priming systems

When there is more than one centrifugal pump to be primed in a station, duplication of a priming device for each pump can be avoided by having one priming device serve all the pumps. Such an arrangement is called a central priming system. If the priming device and the venting of the pumps is automatically controlled, the system is called a central automatic priming system. Fig. 4 illustrates the method of piping up a central priming system.

Vacuum-controlled automatic priming system

A vacuum-controlled automatic priming system consists of a vacuum pump exhausting from a tank and controlled by a vacuum switch so that a range of vacuum, 2 to 6 in. Hg above that necessary to prime the pumps with the greatest suction lift, is maintained in the tank.

The priming connections on each pump served by the system are connected through automatic vent valves and piping to the vacuum tank. The vacuum tank is usually provided with a

gauge glass and a drain, so that if any water accumulates in the tank because a vent valve leaks, it can be detected and the tank drained.

This type of system, illustrated diagrammatically in Fig. 5, is the most commonly used of the central automatic priming systems and has been made with both wet and dry motor-driven vacuum pumps. A comparison of Figs. 4 and 5 shows that manually controlled valves for priming have been replaced by automatic vent valves, and operation of the vacuum pump is automatically controlled by the vacuum switch.

Automatic priming systems using ejectors are feasible, and several systems utilizing water ejectors are on the market.

Automatically and self-primed units

There are on the market centrifugal pumps with various designs of priming equipment incorporated to give a self-contained unit. Some of these have automatic priming devices, fundamentally attachments to the pump, which become inactive after the priming is accomplished. Other units, which should be classified as self-priming pumps, incorporate in the design of the centrifugal pump some hydraulic device so it can function as a wet vacuum pump during the priming period. For stationary use, the automatically primed type is favored as it is more efficient. The self-priming designs are usually more compact and are favored for portable or semi-portable use.

Self-priming units

In self-priming units, the pump design incorporates a chamber or other device, so entrapped water is re-circulated, and, by means of an ejector action, air can be removed from the suction waterways and discharged into the discharge line. Where the presence of air in the discharge line is objectionable, the automatically primed type of unit would be preferred. These special designs will not be included in this discussion, which covers priming methods and systems applicable to conventionally designed centrifugal pumps.

Automatically primed units

A large number of automatically controlled priming systems have been developed for attachment to centrifugal pumps. A pump equipped with such a device is called an automatically primed pump.

For most automatically primed, motor-driven pumps, a rotary wet vacuum pump either directly connected or driven by a separate motor is utilized. With the directly connected vacuum pump type, the controls, which function when the centrifugal pump is primed, open the vacuum pump suction line to atmosphere so that it operates unloaded. With the separately driven vacuum pump, the controls, which function when the centrifugal pump is primed, stop the vacuum pump.

Systems without vent valves

When a pump is primed from the suction side, it is possible to have the vent piping to the vacuum producer in the form of an inverted loop of sufficient height so the water or liquid being pumped will not be carried over into the vacuum producer. Theoretically, it would appear that a loop 34 ft. above the water level would be correct for water. However, with any leakage, air bubbles through the water will lower the net density of the column, and a loop extending 50 ft. or more above the water level will be necessary to prevent liquid being carried over if the vacuum produced is high. Generally, a system incorporating such a high loop is hard to accommodate in a station, and automatic vent valves and other devices can be used more advantageously.

There are some systems in use in which risers without vent valves are used and the vacuum producer is controlled by a vacuum device so the water level in the risers is kept within a range which corresponds to the vacuum range. If there is considerable variation in the suction level, the height of the riser has to be enough to match the water level in the riser resulting from the maximum suction water level and the maximum vacuum. Naturally, the minimum vacuum must produce a water level in the riser slightly above the pump with the minimum water level in the suction supply.

Another system which does not involve the use of a vent valve is illustrated in Fig. 6. This system can be used also as a central priming system to serve pumps taking their suction from the same source.

Time required for priming

The time required to prime a pump with a vacuum producing device is dependent upon (1) the total volume to be exhausted, (2) the initial and final vacuum, and (3) the capacity of the vacuum producer over the range of vacuums that will result in the priming cycle. The actual calculations to determine the time necessary to prime a pump are involved. To permit close approximations, jet primers are usually rated in net capacity for various lifts, so it is simply necessary to divide the volume to be exhausted by the rating to get the approximate priming time. Unless such a simplified method of calculating the required time is available, the selection of the size of primer would be best left to the vendor of the equipment.

Central automatic priming systems are usually rated for the total volume to be kept primed.

System for air-charged waters

Some water, especially from wells, have considerable dissolved gas which is liberated when it is attempted to handle it with a suction lift. In such installations an air separating tank (also called by some a priming tank and by others an air eliminator) should be used in the suction line. One type using a float-operated vent valve to permit the withdrawal of the air or gas is shown in Fig. 7. Another arrangement uses a float valve mounted on the side of the tank controlling directly the starting and stopping of the vacuum pump. With this arrangement there is danger of frequent repeated starting and stopping of the vacuum pump unless the air separating tank is relatively large and the capacity of the vacuum pump is only a little larger than the amount of air to be evacuated.

When sand is also present in the water the air separating tank can be made so that it functions as well as a sand trap.

Priming of steam turbine driven units

With a steam turbine driven pump, the most logical means of priming is a steam air ejector. If the unit is a condensing unit, the vacuum existing in the condenser can be utilized in conjunction with an automatic vent valve to keep the unit automatically primed. However, if there is considerable leakage, the regular steam air ejector serving the condenser may not be able to handle this additional volume of air, and the condenser performance will be affected. A regular steam condenser should not be used as a source of vacuum for priming except with tight suction lines and unless the condenser is served by an oversize ejector. Care must be taken with such an arrangement to prevent leakage of water from the pump into the condenser, as that would contaminate the condensate. This requires a constant check of the automatic vent valve to insure that it seats tightly.

Controls to prevent operation if not primed

Various controls depending upon the priming system installed have been used to prevent the operation of a pump if not primed. For most installations some form of float switch in a chamber connected into the suction line is used. If the level in the chamber or tank is above the impeller eye of the pump, the float switch control permits the operation of the pump. If the level falls below a safe value, the float switch acts through the control to stop the pump if running or to prevent its being started if out of service.

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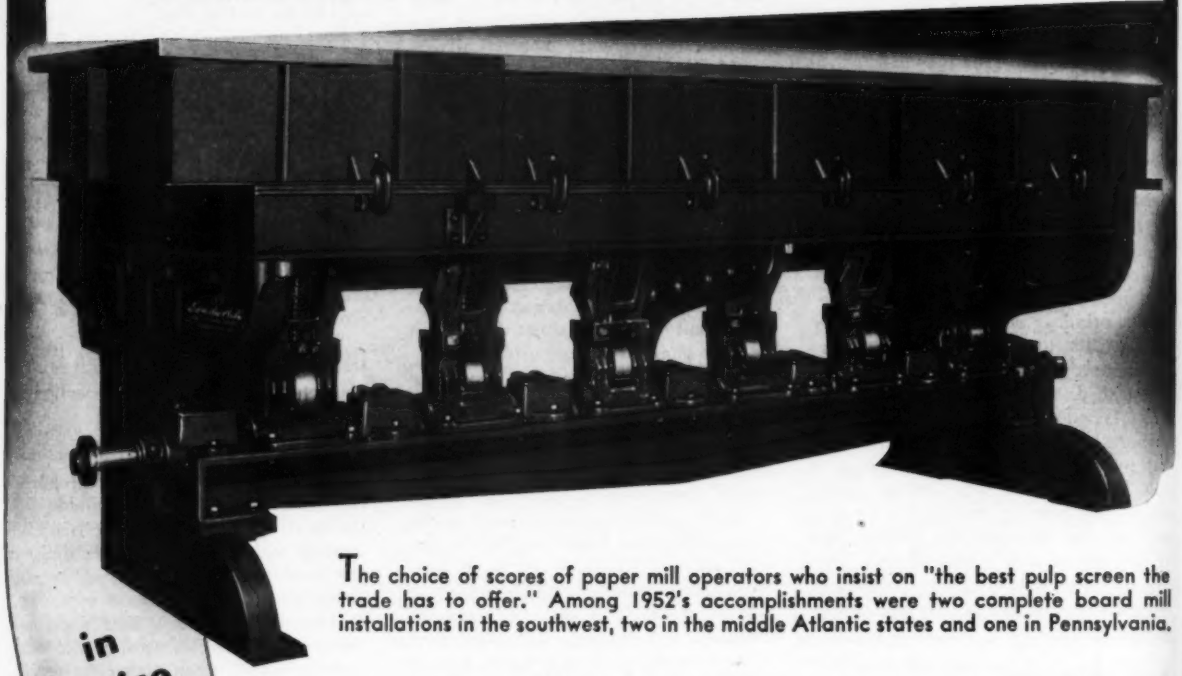
Packer Superscreen



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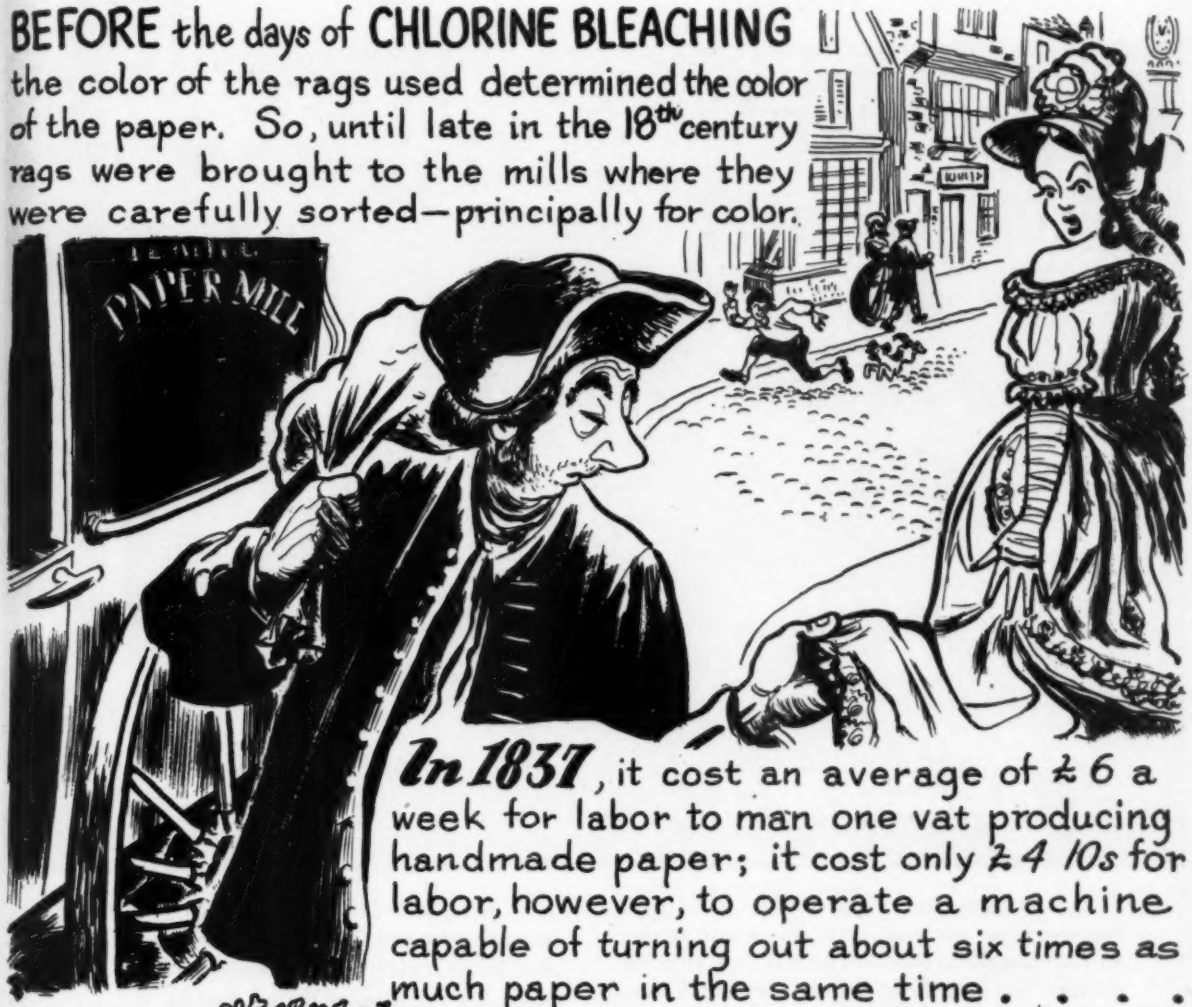
Associated with Canadian Vickers, Ltd., Montreal, Builders of Sandy Hill Designed Machinery in Canada

BEFORE the days of **CHLORINE BLEACHING** the color of the rags used determined the color of the paper. So, until late in the 18th century rags were brought to the mills where they were carefully sorted—principally for color.



In 1837, it cost an average of £6 a week for labor to man one vat producing handmade paper; it cost only £4 10s for labor, however, to operate a machine capable of turning out about six times as much paper in the same time. . . . .

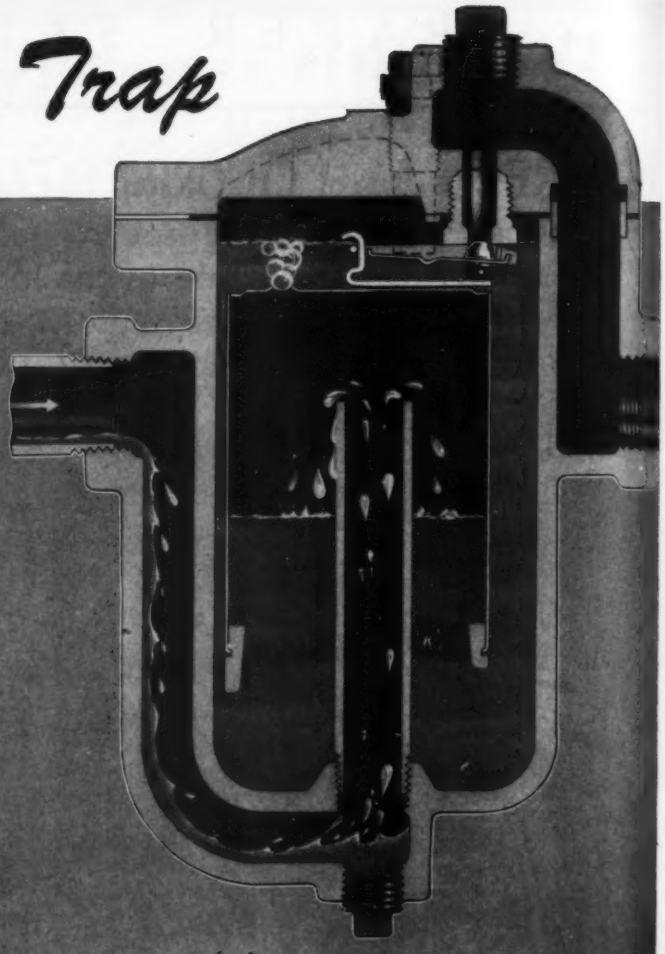
A lightweight KENNEL made of waterproof, shock resistant, corrugated board, is being used to transport dogs by *AIR*.

IN OLDEN DAYS . . .

Odd Bits

Japanese farmers and their wives made extra money helping make Japanese style paper in their spare time.

This Steam Trap



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STEAM traps haven't always worked so well for draining paper machines. First, they wouldn't vent air fast enough, so that heat-up was slow after the machine had been down. Second, they didn't wear too well.

The Armstrong No. 813D steam trap was designed to answer these objections. That it does has been proved by many mills with individual 813D traps on each dryer.

Large air venting capacity is secured with oversize bucket vents.

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With this trap you get all the advantages of simplicity, economy, dependability and fast drainage with none of the previous disadvantages. SEND FOR BULLETIN No. 205.

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Inverted Bucket Steam Traps
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"Icing off the Cake," Fowler Tells Canadian Investment Dealers

THE CANADIAN PULP AND PAPER industry is facing difficult times in many respects, but past performance indicates that the industry has wisely equipped itself for a period of struggle. This was the view expressed in June by R. M. Fowler at the annual meeting of the Investment Dealers Association at Bigwin Inn, Ont. Mr. Fowler is president of the Canadian Pulp and Paper Association and the Newsprint Association of Canada.

Discussing the possibilities of a truce in Korea and an end to the cold war throughout the world, Mr. Fowler declared that there is no reason to believe that business on the North American continent cannot achieve a smooth transition from some portion of the defense program toward increased production for civilian use.

". . . the days of easy progress appear to be over—at least for the time being," he continued. "The (pulp and paper) industry is still operating at a high level of activity, but it is no longer enjoying full order books nor able to operate quite at full capacity. The icing is off the cake. I believe that in the last 10 years the industry has wisely equipped itself to cope with a period of struggle, but it would be foolish not to recognize that such a period of struggle is facing it today. It would also be foolish to ignore certain problems and weaknesses that have developed."

A sound industry

Mr. Fowler told his audience that the Canadian pulp and paper industry is a sound industry—sounder than it has ever been before. Its annual output in 1951 and 1952 was valued at about $1.25 billion, compared to a quarter of a billion in the late thirties. The volume of production during each of the last two years has been close to 9,500,000 tons. The annual value of pulp and paper exports in the last two years exceeded $900,000,000 and provided about 23 per cent of all Canadian exports and about 34 per cent of all Canadian products exported to the United States. The number of employees, apart from seasonal workers in the woods, rose from about 35,000 in 1938 to more than 66,000 in 1951, and the total salaries and wages jumped from less than $43,000,000 in 1938 to $213,000,000 in 1951.

"The capital employed by the industry," he declared, "was about $600,000,000 before the war and is today in excess of $1,500,000,000. . . . Taken together, these statistics show this as the leading industry in Canada, accounting directly and indirectly for about one dollar out of every seven of the income of all Canadians, and of major importance to our international trade."

Newsprint the leader

"At the present time the operating rate is high," Mr. Fowler continued. "To be sure, it is not in all segments as high as it has been. There are some commodities and some markets that are running below capacity for lack of demand to run full. The largest single item—newsprint—is actually running ahead of last year, at an all-time record level. Canadian production in the first four months is about 2 per cent greater than last year, and U.S. consumption (which accounts for approximately 87 per cent of our market) has been nearly 3 per cent greater than in 1952. . . .

"In other branches of the industry there have been some declines—mainly in the export market for pulp and in the relatively small proportions of paperboard and fine papers that are exported. In the first quarter of this year the operations of the industry, other than the newsprint section, are down about 15 per cent compared to last year. . . ."

The diversification that has come about with the expansion of production in recent years was hailed by Mr. Fowler as one of the strengths of the industry. Although newsprint capacity and production have grown rapidly, newsprint has not grown as fast as other paper and pulp products. Before the war, newsprint took more than 70 per cent of the total Canadian pulp produced; it now takes about 63 per cent. Newsprint production is about 65 per cent greater, while the production of pulps for uses other than newsprint is 3.5 to 4 times as great as before the war.

Financial strength

"Financially, Canadian pulp and paper companies are much stronger than they were before the war," the speaker declared. "These companies in 1939 had a total indebtedness in bonds and debentures of $187,200,000; by 1951 that total had become less than half as great at $96,700,000.

"The improvement in the financial picture was largely brought about by the ploughing back of earnings. For many years, and especially during recent years when earnings have been better, these companies have averaged more than 60 per cent reinvested in the business." This compares with a 43 per cent figure for Canadian industry as a whole.

High costs a problem

Discussing the difficulties facing the industry, Mr. Fowler declared that the problems of the present mainly seem to be those arising from high costs, and their solution can be found only in the reduction of costs. . . . With demand running at rates that do not call for the full use of present capacity, it would seem unlikely that the solution can come from increases in prices.

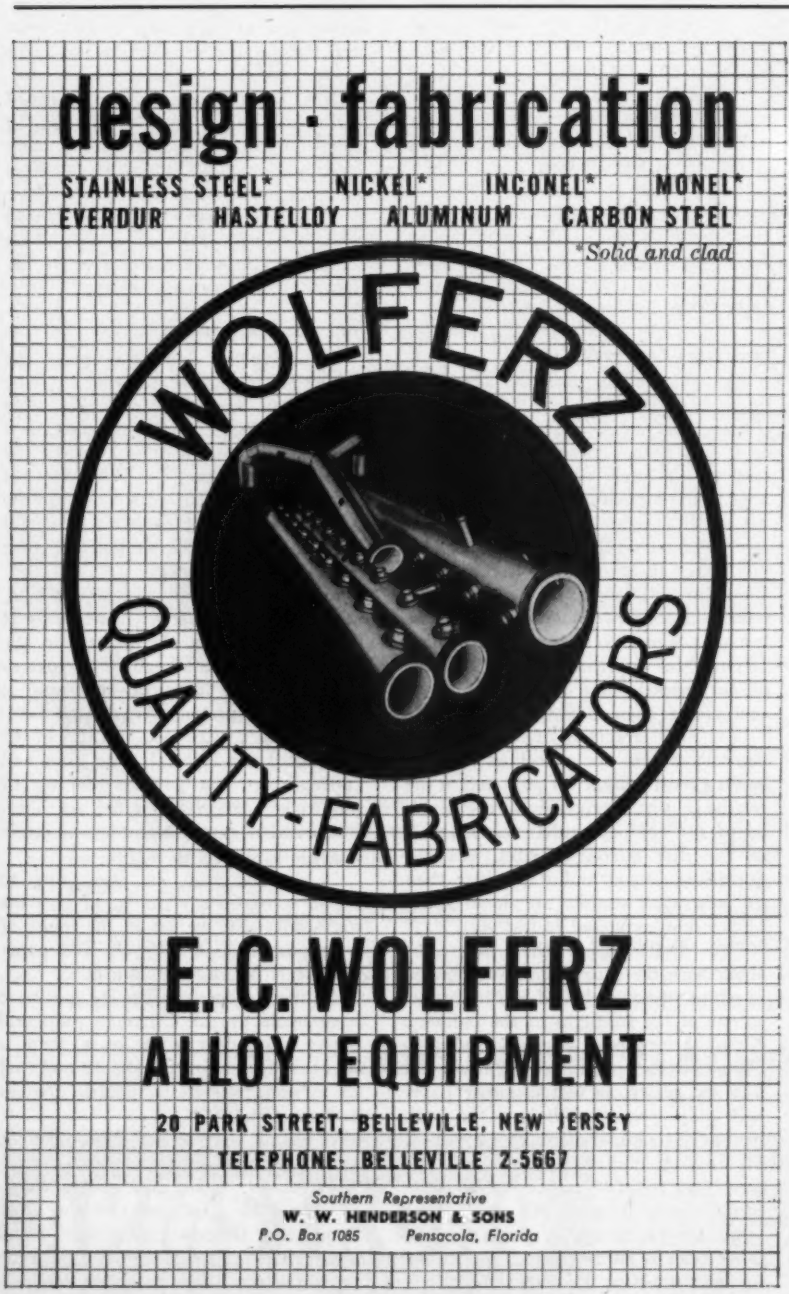
At the present time, all costs are high, he pointed out. In eastern Canada, wood costs are probably the highest in the world. The burdens imposed by government levies are high also—not only in the form of income taxes, which naturally fall as profits fall, but also in the form of ground rentals, fire dues and cutting rates that go into the cost of pulpwood. And labor rates are absolutely and relatively high and are under heavy pressure to go higher.

"I do not wish, in attempting to sound a vigorous warning, to give the impression that we are in the midst of a serious crisis in the pulp and paper industry," Mr. Fowler concluded. ". . . With the great strides forward that have been made by the Canadian pulp and paper industry in recent years, there is no cause for alarm if it should find that its curve of progress temporarily flattens or fluctuates.

"I cannot tell you whether or not the several partners in the industry—capital, management, labor and government—will respond adequately to the challenges that are now facing them. But I am inclined to think it is a good thing that an apparently moderate, not-too-

difficult set of problems is being presented to us today. The good years since the war have been used by the companies with wisdom and moderation to improve their plants and their production skills, to strengthen their financial structures; and to keep their price advances to a minimum. But there are other business skills that, in recent years, have had little claim for attention. Management has not been compelled to press for economy and efficiency; salesmen have not had much practice in the arts of selling; production men have not had to worry greatly about quality when the whole emphasis has been on quantity.

". . . Any industry is only as strong as the men who are in it. At the present time, there is only a handful of men in senior positions in the management and labor unions of any of the companies with experience in the problems that arise when productive capacity is greater than demand. The skills to deal with such problems need to be polished up. It may well be that this industry is fortunate to have the chance to develop these human skills in a period of moderate readjustment. If it does so—as I believe it will—it will be better able to meet the problems of a time of major difficulty, if that time should ever come."



CPPA Pacific Branch Technical Section Announces Fall Meeting

The Pacific Coast Branch of the Technical Section of the Canadian Pulp and Paper Association will stage its fall meeting October 3 at the Devonshire Hotel in Vancouver, B. C. The program will include technical papers on various subjects.

Superintendents Dryer Felt Committee to Investigate Felt Tension

The possibility of preparing a readily usable method of calculating felt tension so that operators can obtain and list such information is to be explored during the coming year by the machine builders sub-committee of the Dryer Felt Committee of the Superintendents Association. This was revealed in Atlanta in June during the annual convention of the association. It was the ninth official meeting of the committee.

Following the opening session of the group, at which W. K. Metcalfe of J. O. Ross Engineering Corp. reviewed the history, scope, purpose, and plans of the committee, spokesmen for each of the six sub-committees presented their annual reports. These sub-groups are as follows: (1) dryer felts; (2) use of felts on the machine; (3) machine design and arrangement; (4) machine dryer drainage; (5) air drying around the felts, and (6) controls and instruments. A new sub-committee was created to be known as the special sub-committee for the purpose of organizing several related interests. It is under the direction of William Stitt.

The sub-committee on air drying offered to conduct tests on various types of felt to determine the possibilities of utilizing equipment similar to the Happer felt dryers now in use in England.

Present at the Atlanta meeting were Howard H. Street of National Vulcanized Fibre Co. and Mr. Metcalfe, co-chairmen; James M. McAlear, Leslie G. Janett and Mr. Stitt (sub-committee chairmen), and Allen A. Lowe, R. Schneble, Putnam Head, Howard Barker, George Schuning and Gordon Chalmers.

The next meeting of the group will be during Paper Week in New York, N.Y., in February.

Crocker Elected by Eastern District, Empire State Tappi

At a meeting May 23 at Glens Falls, N. Y., John W. Crocker of Sandy Hill Iron & Brass Works was elected 1953-54 chairman of the Eastern District of Empire State Tappi. The meeting was the last of the season and was the annual ladies' night.

Other officers of the section chosen at the gathering were as follows: Grant

Cole of Diamond Match Co., vice chairman; George H. Hocking of Socony-Vacuum Oil Co., secretary-treasurer; Oscar Anderson Jr. of International Paper Co., program chairman; William S. Spiller of Marinette Paper Co., publicity chairman, and Thomas McGreen of the Research Division of International, entertainment chairman.

E. C. Berg Elected Chicago Tappi Chairman

E. C. Berg of Ace Carton Co. was elected 1953-54 chairman of the Chicago Section of Tappi at the May 18 meeting. Other officers for the coming year are: J. D. Johnson of Container Corp. of America, vice chairman; James Lyons of Atlas Boxmakers Inc., secretary, and J. J. McIntyre of H. B. Fuller Co., treasurer.

Guest speaker at the gathering was J. D. Wallace of Proctor & Gamble, who discussed packaging specifications for high-speed automatic machinery. In high-speed operation, he said, uniformity is the keynote. The supplier must first get in line, then maintain uniformity. It is the purpose of the purchaser to tell suppliers what is needed and not how to make the material.

Packaging lines, Mr. Wallace declared, are jammed more frequently because of non-uniformity than for any other reason. Among the other important considerations he listed were: (1) Size, both as to die size and size of the finished carton; (2) ink bleed; (3) prebreaking; (4) strength and sealability of board, and (5) rub and heat resistance.

With reference to containers, the speaker pointed out that size must be uniform within comparatively close tolerances. Scoring must be heavy enough to bend easily when used on the packaging line; and sometimes the location of the manufacturers joint on the container is important. In conclusion, Mr. Wallace listed as possible new specifications a performance test for prebreaking and score stiffness and a friction test. The rub and sealability tests can be improved, he added.

PACKAGING material specifications was the subject of J. D. Wallace at the May meeting of Chicago Tappi

Association Notes

New York-Canadian Supts.
will hold its 1953 fall meeting September 17-19 in the Canadian Laurentians. Two hotels will be used for the gathering: the Alpine Inn at Ste. Marguerite, Que., and the Ste. Adele Lodge at Ste. Adele-En-Haut.

Pacific Coast Supts.
will hold the annual divisional meeting December 4-5 at the New Washington Hotel in Seattle.

Penjerdel Supts.
will hold its 1953 fall meeting October 23-24 at the Pocono Manor, Pocono Manor, Pa.

AMONG THOSE ATTENDING the annual summer meeting of the board of directors of the Tissue Association Inc. at Baileys Harbor, Wis., recently were (l to r): David Champion, sales manager of Burrows Paper Corp.; Ralph Burrows, president of Burrows; Don Feller, vice president of Erving Paper Mills; William Servotte, general manager of Bay West Paper Co. and president of the Association; W. F. Erisman, vice president and general manager of Erving; H. G. Wintgens, vice president of Hoberg Paper Mills; W. A. Littlefield of Brown Co., and A. H. Ginsberg of Statler Tissue Corp.

Coming Events

TAPPI meetings

Sept. 15-16—Plastics Conference, New York State College of Forestry, Syracuse.
Oct. 8-9—Tenth Fibrous Agricultural Residues Conference, Trenton, Ont.
Oct. 15-16—Third Corrugated Containers Conference, Statler Hotel, New York, N.Y.
Oct. 26-29—Eighth Engineering Conference, Sheraton-Mount Royal Hotel, Montreal.
Nov. 18-20—Seventh Alkaline Pulping Conference, Rice Hotel, Houston, Texas.
Feb. 15-18—39th Annual Meeting, Commodore Hotel, New York, N.Y.

American Pulp & Paper Mill Superintendents Association meetings

Sept. 11-12 — Northwestern Division, Hotel Wausau, Wausau, Wis.
Sept. 17-19—New York-Canadian Division, The Alpine Inn and the Ste. Adele Lodge, Ste. Marguerite, Que.
Sept. 17-19 — Northeastern Division, Poland Spring House, Poland Spring, Maine.
Oct. 23-24—Pennsylvania-New Jersey-Delaware Division, Pocono Manor, Pocono Manor, Pa.
Oct. 28-30—Southern and Southeastern divisions (joint meeting), Edgewater Gulf Hotel, Edgewater Park, Miss.
Dec. 4-5—Pacific Coast Division, New Washington Hotel, Seattle.

Other meetings

Sept. 13-16—The Electrochemical Society, Ocean Terrace Hotel, Wrightsville Beach, N.C.
Oct. 3—Pacific Coast Branch, Technical Section, CPPA, Devonshire Hotel, Vancouver, B.C.
Oct. 6-7—Fibrebox Association, fall meeting, Waldorf-Astoria Hotel, New York, N.Y.
Oct. 19-23—National Safety Congress, Pulp and Paper Section, Conrad Hilton Hotel, Chicago.
Oct. 20-22—1953 Industrial Packaging and Materials Handling Exposition, sponsored by the Society of Industrial Packaging and Materials Handling Engineers, Boston.
Oct. 27—Association of Consulting Chemists and Chemical Engineers, Hotel Belmont Plaza, New York.
Nov. 4-6—National Paperboard Association, annual meeting, Waldorf-Astoria Hotel, New York, N.Y.
Dec. 6-8—Chemical Specialties Manufacturers Association Inc., 40th annual meeting, Mayflower Hotel, Washington, D.C.
Dec. 13-16—American Institute of Chemical Engineers, annual meeting, Hotel Jefferson, St. Louis, Mo.

"K" Fittings in
Another Great Building

It is common practice for "K" Fittings to be used in buildings of all types and sizes. So we are not citing their use in the Government Accounting Office Building as something unusual, but the structure itself is interesting.

The outside dimensions are 328 x 578 ft. The building is seven stories high, with basement and subbasement. It houses 9,000 people. Feeding service accommodates 2,000 at one seating. An auditorium seats 250. There are garage facilities for 800 cars.

Pipe fitters like to work with "K" Fittings. The threads are tapped full and clean. Openings are chamfered so pipe enters easily. Precise angularity of machining assures symmetrical runs. Uniform walls and high tensile strength give "K" Fittings the stamina to withstand the most severe make-up strain.

It pays to order fittings from distributors who handle the "K" line.

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Combined marketing facilities with
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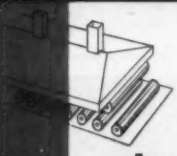

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The Paper Industry Names in the News

P. C. Baldwin

F. W. Plowman

D. A. Prouty

Paul Brown

Scott Names Baldwin Vice President; Others Appointed

Scott Paper Co. has announced the election of *PAUL C. BALDWIN* as vice president. Mr. Baldwin, who is in charge of the company's West Coast operations, has been assistant vice president since 1951. He will continue to operate under the direction of U. M. Dickey, Scott's senior officer on the Coast.

Having joined the firm in 1940 as an assistant in the Chester, Pa., pulp laboratory, Mr. Baldwin served for a time as technical control director. He became paper mill superintendent in 1943 and was named manager of the Chester plant in 1947.

In 1950 he was appointed assistant to the general operating manager and was made assistant vice president shortly after the 1951 merger with Soundview Pulp Co.

Additional promotions

Scott has also announced the designation of Vice President *FRANCIS W. PLOWMAN* as assistant to the president and the election of *D. A. PROUTY* to the newly created post of assistant vice president in charge of public relations. *PAUL BROWN* will replace Mr. Prouty as national retail sales manager.

Mr. Plowman, a vice president and director of Scott, has been general sales manager since July 1943. He joined the firm in 1928 and in 1938 was made assistant controller. He entered sales research and promotion in 1940; and when Scott established its subsidiary, Marinette Paper Co., in 1941 he was placed in charge of that division's sales activities.

Mr. Prouty, national retail sales manager, joined Scott in 1926 and was elevated to his present position in 1938. Mr. Brown has been with the firm since 1931. He has been southern retail divisional sales manager since 1946.

Distribution committee

Thomas B. McCabe, president of Scott, has also announced the formation of a distribution committee to direct and coordinate the company's sales, advertising, marketing research, traffic, and related activities. Members of the committee are: *J. D. BOWDEN*, manager of marketing research; *PAUL BROWN*, retail sales manager; *H. R. HVID*, assistant industrial sales manager; *HARRY C. PARDEE*, assistant vice president and director of advertising, and *F. L. WITT*, assistant industrial sales manager.

Dr. Sproull in New Post At Herty Foundation

DR. REAVIS C. SPROULL, formerly technical director, has been elected to the position of director of the Herty Foundation at Savannah, Ga. The appointment was announced at the annual meeting of the trustees of the organization. It was also revealed that *GEORGE N. KEMP* had been chosen pilot plant superintendent.

The following officers of the Foundation were reelected: *SHELBY MYRICK JR.*, chairman of the board; *JOHN W. MIDDLETON*, vice chairman; *MISS JANINE JOHNSON*, secretary, and *MRS. SUE WINTER*, treasurer.

Eastern Corp. Advances Four Executives

Charles G. Paine, vice president and general manager of Eastern Corp., has announced the appointment of *W. DOUGLAS SOMMERVILLE* as vice president in charge of production. He will have complete charge of all pulp and paper production and technical development at Eastern mills.

Simultaneously, three additional Eastern executives were advanced.

W. D. Sommerville

F. H. Stetson

L. C. Lynch

D. W Danforth

FREDERIC H. STETSON moves to chief engineer; *LAWRENCE C. LYNCH* will be the new service director, and *DONALD W. DANFORTH*, formerly assistant to Mr. Sommerville, becomes general superintendent of the Brewer paper mill.

A native of England, Mr. Sommerville was employed by a British paper manufacturer before joining Eastern in 1911. He served with the British army during World War I and returned to Eastern in 1919. In 1928 he became manager of paper manufacture.

Associate Dean Named at N. Y. State College of Forestry

Four men, including an associate dean, have been named to the faculty of the State University of New York College of Forestry at Syracuse. Their appointments were announced by Dean Hardy L. Shirley.

DR. HAROLD G. WILM was made associate dean of biological sciences and graduate studies, filling a position held from 1945 to 1952 by Dr. Shirley as assistant dean. Following Dr. Shirley's promotion to the deanship in July 1952, administrative duties were reorganized and the title of the position changed from assistant to associate dean. Dr. Wilm, who will assume his new post September 1, is currently chief of the

Division of Forest Influences in the U.S. Forest Service.

A native of Colorado, Dr. Wilm has been with the Forest Service since 1932. He is a 1929 graduate of Colorado College and received his M.F. and Ph.D. degrees from Cornell University. He has served the U.S.F.S. at experiment stations in the Midwest, California and the Rocky Mountains. In 1948 he was made forester in charge of flood control at the Southern station in New Orleans. A year later he joined the Pacific Northwest station at Portland, Ore., as chief of flood control surveys. Dr. Wilm was promoted to chief of the forest influences division in Washington in 1951.

Other appointments at the college include: *JEROME G. KOVALCIK* of Plattsburgh, N.Y., assistant professor of forest extension; *RICHARD E. PENTONEY* of Syracuse, instructor in wood technology, and *DR. CHARLES H. LEIGH* of Richmond, Va., research assistant in forest chemistry.

Mr. Pentoney is a former employee of Weyerhaeuser Timber Co. and of the Forest Service and was one of four students in the United States who were awarded summer research scholarships in 1951 by Timber Engineering Co., Washington, D.C.

Mando, O & M Appointments

Appointment of *E. L. LAMB* to assistant director of research in charge of pulp and paper was announced recently by Robert Faegre, executive vice president of Minnesota & Ontario Paper Co. At the same time, Ontario-Minnesota Pulp & Paper Co. Ltd., a Mando affiliate, announced the appointment of *RUDOLPHE PARADIS* as assistant to the vice president and general manager, J. F. McKellar.

Mr. Lamb was the director of research for Oxford Paper Co., Rumford, Maine, prior to his appointment at Mando. He had been a member of the Oxford research staff since 1930. Previously, he had been with Scott Paper Co. Mr. Paradis was formerly resident manager for Howe Sound Pulp Co. Ltd.

MELVIN H. BAKER, chairman of the board of National Gypsum Co., has been honored with the degree of Doctor of Science in Business Administration by the University of Maryland.

J. D. ZELLERBACH, president of Crown Zellerbach Corp., has been elected to the board of trustees of Mills College for a five-year term.

CHARLES H. CORNELL has been named treasurer of Tileston & Hollingsworth Co., Boston, Mass.

AMOS B. MINER, general sales manager of the industrial division of National Gypsum Co., has been elected president and chairman of the board of the National Lime Association.

CECIL E. TAYLOR, vice president in charge of the Eastern Division of Gaylord Container Corp., retired recently.

AUBREY T. TAYLOR, vice president and plant manager of the National Container Corp. mill at Big Island, Va., has been elected a director of the Central Virginia Industries.

A 25-YEAR employee of National Container Corp., John Palozzolo (l) receives 25 shares of the firm's common stock from Samuel Kipnis, president; the occasion was a dinner held in New York, N. Y., in honor of the 44 charter members of National Container's new Quarter Century Club

J. McK. LIMERICK, research director for Bathurst Power & Paper Co. Ltd., Bathurst, N.B., was recently granted a fellowship in the Chemical Institute of Canada.

E. A. PAGE, personnel superintendent at Kimberly-Clark Corp., has been named one of three vice presidents of the Wisconsin Council of Safety.

DR. A. H. GROUP has been appointed manager of company laboratories for Hammermill Paper Co. Succeeding him as manager of the technical control section is *DR. RICHARD W. BROWN*. *JOSEPH C. HIGGINS* has been named manager of mill testing.

EMANUEL J. JOHNSON has been appointed purchasing agent for the southeast area of Rayonier Inc. Associated with the firm since 1937, Mr. Johnson was previously in charge of purchasing for the Fernandina Division.

FRED G. BARBER has been named superintendent of the Middletown, Ohio, carton plant of The Gardner Board & Carton Co. Prior to his joining the firm, he was plant manager of the American Coating Mills carton plant at Grand Rapids, Mich.

E. R. Leonhard, president of Paterson Parchment Paper Co., in Bristol, Pa., has announced the appointment of *JOHN W. GREVE* as manager of the firm's Waxed Paper Division. Mr. Greve joined Paterson in 1950 and has assisted in the development of waxed paper sales since that time.

Marinette Paper Co. at Menominee, Mich., has announced the following personnel changes: *ROBERT MOFFITT*, paper mill quality supervisor, is to be assistant chief consumers representative;

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EDWARD KEHOE, instrument technician, becomes steam plant supervisor, and *WILLIAM J. BECKETT* of Chester, Pa., has been named instrument engineer at the Marinette plant.

JAMES E. PEMBERTON, for the past 12 years superintendent of the St. Regis Paper Co. office and pulp dock at Waddington, N.Y., retired June 30. He is being succeeded by *WILLIAM RUDKOFF.*

WILLIAM H. ANDERS, long a prominent figure in the paper industry, is returning to Perkins Goodwin Co. as an advisory consultant on sales. He was retired recently from his position as a vice president of St. Regis Paper Co. in charge of the Nashua Division. Mr. Anders began his business life as a pulp salesman for Perkins Goodwin.

Atchison Joins P&W

DR. JOSEPH E. ATCHISON, with a long record of service in the paper industry before entering government work, has become an executive staff member of Parsons & Whittemore to serve in connection with P&W's plans to develop paper production abroad as a private "Point Four" program. After service as chief of the pulp and paper branch of the Mutual Security Agency, Dr. Atchison joined Puerto Rican Paper Products Inc. to help in the development of the use of bagasse and similar agricultural residues for the manufacture of paper. His work in Puerto Rico followed service as a consultant to the Hawaiian Sugar Association in research in the use of bagasse with a view to developing a paper industry in the islands.

J. E. Atchison

D. C. Colebaugh

DAVID C. COLEBAUGH JR., research chemist in the Nuchar Research Laboratory of West Virginia Pulp & Paper Co. at Tyrone, Pa., has been assigned to the Chicago sales staff of the company's Industrial Chemical Sales Division. He will service the firm's active carbon, tall oil and lignin accounts in the Midwest.

WALTER W. HANES, assistant director of labor relations for St. Regis Paper Co., has been appointed assistant to Willard E. Hahn, vice president and

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resident general manager of the Kraft Center at Pensacola, Fla. He will deal particularly with industrial relations, including personnel, labor and community relations.

HUGH W. SLOAN, vice president of St. Regis Sales Corp., has joined St. Regis Paper Co. (Canada) Ltd. He will assist the vice president and managing director.

ARTHUR S. WELLS, plant engineer for the Mead Corp.'s Kingsport Division for many years, is being transferred to the company's general engineering department in Chillicothe, Ohio, where he will serve as assistant to the chief engineer, C. N. Mull. Succeeding Mr. Wells at Kingsport is *LOUIS L. MRACHEK*, who has been construction engineer for the past two years.

Alling & Cory Co. has announced the elections of *MONROE G. BINGEMAN* and *A. ROBERT PATCHEN* as vice presidents.

The resignation of *FRANK J. DVORAK* as president of the Wisconsin Valley Trust Co., Wausau, has been accepted by the board of directors. Mr. Dvorak is vice president of Marathon Corp. in charge of the firm's financial division and has recently been transferred to the Menasha offices. At the same time, the board of Wisconsin Valley Trust named *NORMAN S. STONE*, general manager of Mosinee Paper Mills Co., secretary-treasurer.

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R. J. Van Nostrand

W. L. Gilman

ROBERT J. VAN NOSTRAND has been appointed Midwestern representative of the Pulp Sales Division of Brown Co. He succeeds *WILLIAM L. GILMAN*, who has retired after 46 years of continuous service in various departments of the firm. Mr. Van Nostrand is a graduate of the Institute of Paper Chemistry.

W. P. Katz

W. H. Greenberg

Gibraltar Corrugated Paper Co. Inc., North Bergen, N.J., has announced the appointment of two new vice presidents. *WILLIAM P. KATZ*, formerly vice president and director of production, has been made executive vice president in charge of production; *WILLIAM H. GREENBERG*, formerly vice president and director of sales, has been appointed executive vice president in charge of sales.

ARNETT W. LESLIE of Minneapolis has resigned as chairman of the board and treasurer of John Leslie Paper Co. He retains relationship to the firm as a consultant under an executive employment contract but plans to devote his major efforts to the Minneapolis YMCA, of which he became president July 1. Mr. Leslie had been with the firm 39 years.

CURTIS RICE, mechanical packaging manager of Sutherland Paper Co. at Kalamazoo, has been made an Admiral of the American Airlines Flagship Fleet in recognition of many contributions to the development of air transportation as a public service.

JERRY DALE, formerly with the Associated Press in New York, N.Y., has been named assistant editor of the *Paper Maker*, semi-monthly publication

of the AFL International Brotherhood of Paper Makers. He will serve in a similar capacity for the quarterly *Paper Maker's Journal*. Mr. Dale will headquarter at the union's offices in Albany.

JOHN J. RYMELL has been appointed superintendent of the Syracuse, N.Y., division of United Board & Carton Corp. A graduate of Syracuse University, he has been associated with the firm 24 years.

J. A. HANNA is the new manager of operations for Bathurst Power & Paper Co. Ltd. He has been assistant manager of operations and was mill manager at Bathurst from 1943 to 1951. Previous to his association with the firm, he was with Dryden Paper Co., Celotex Corp., and Brown Corp.

Four employees of Hammermill Paper Co., Erie, Pa., marked significant service anniversaries in June. *FRANK FURSKI*, bleacherman in the sulfite mill, rounded out 40 years of continuous service. Three attained the 35-year mark: *WILBUR ELDREDGE*, district sales manager in the south central territory; *PARKE HERRICK*, production traffic manager, and *HERMAN MILLS*, crane switchman.

DEAN O. BOWMAN has been made secretary of Crown Zellerbach Corp.'s planning committee. Mr. Bowman comes to C-Z from the National Production Administration, where he was the assistant administrator in charge of policy coordination, a function similar to the one he will perform for Crown Zellerbach. Prior to his association with NPA, he was assistant director of the Office of Industry and Commerce of the U. S. Department of Commerce.

The Paper Industry Necrology

Theodore E. Knowlton

Theodore Ely Knowlton, chairman of the board of Knowlton Bros. Inc., Watertown, N.Y., died July 19 at his home. He was 80.

A civil engineer, Mr. Knowlton became associated with the firm in 1932 as vice president and general manager. He was named president in 1938 and chairman of the board in 1948.

Peter J. Christman

Peter J. Christman, 59, died at his home in Green Bay, Wis., July 16. Mr. Christman organized Paper Converting Machine Co. in 1920 and later Bay West Paper Co. In 1928 Bay West was sold to Mosinee Paper Mills Co. Mr. Christman retired from active business life in 1946 with the sale of Paper Converting.

However, he had continued working on inventions in the field of paper converting machinery. At the time of his death, Mr. Christman had just completed work on a new development concerning packaged cones.

Vernon E. Bannow, 42, for the past 13 years assistant purchasing agent of Marinette Paper Co., died July 6. He had been an employee of Marinette for 25 years.

George Slater Barkentin, 70, former sales manager of the New York, N.Y., office of Fort Orange Paper Co., died July 10.

J. Kermit Brandeberry, United States Forest Service representative in Lincoln, Neb., since 1948, collapsed and died July 7 while attending a conference in the governor's office. He was 47.

Gerard Herbert Lafontaine, 56, assistant to the vice president in charge of production at Howard Smith Paper Mills Ltd., Montreal, died July 7.

Harold F. Loock, 50, a civil and construction engineer with Consolidated Water Power & Paper Co. for 24 years, died July 2.

James F. Cleary, 74, former president of Kansas City Fiber Box Co., died July 14 at his home in Hinsdale, Ill. Mr. Cleary became a vice president of Hinde & Dauch Paper Co. in 1914, when that firm absorbed the Kansas City company.

Mortimer Fleishhacker, president of Fleishhacker Paper Box Co., died in San Francisco July 13. He was 86. Well known as a West Coast philanthropist, Mr. Fleishhacker was associated with numerous California business and industrial organizations and at one time served as president of the Anglo-California National Bank. He was founder and chairman of Great Western Electro-Chemical Co., which he later sold to Dow Chemical Co.

Charles Drury Jacobs, 79, a specialist in watermarked paper, died July 1 in

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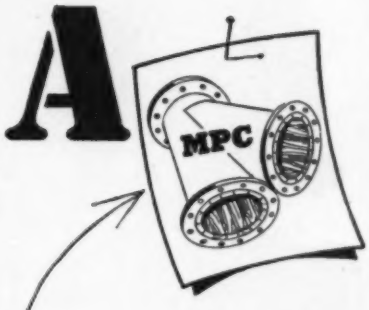
A



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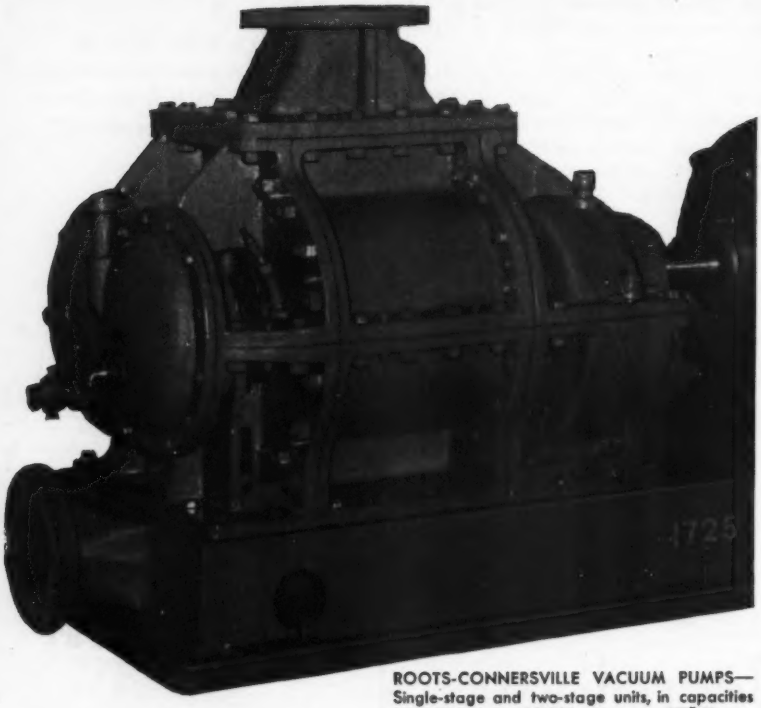

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Smaller floor space required
Reduced power consumption
Low maintenance expense
Less expensive foundations
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Morristown, N.J. He made his home in Bernardsville.

John Wesley Vivian, 91, "dean of the wholesale paper dealers" in Boston, died June 30 in a Connecticut hospital. He was president of Cook & Vivian and was a member of the Boston Paper Trade Association and the New England Paper Trade Association.

Frederic L. Thompson, 81, died June 11 at Rye Beach, N.H. Until 1923 he was treasurer of Moore & Thompson Paper Co. at Bellows Falls, Vt. In recent years this mill has been operated as a division of Hudson Pulp & Paper Corp.

J. Warren Marshall, president of National Vulcanized Fibre Co., died June 25 in a Wilmington, Del., hospital. He was 72. Mr. Marshall was also president of Fibre Specialty Mfg. Co. and a director of the Wilmington Trust Co.

J. Vanden Broeck, 39, head fireman for Thilmany Pulp & Paper Co., died July 15 at his home in Kaukauna, Wis.

Arthur J. Edward, superintendent of the control department of Canadian International Paper Co., Three Rivers, Que., died May 3. Previous to his association with Canadian International, he had been employed by New Brunswick International Paper Co. at Dalhousie, N.B. Mr. Edward was a long-time member of the Superintendents Association and had been active in association activities.

John S. Mullin, 78, retired paper mill supply manufacturer, died at his Philadelphia home July 17.

Frederick Keenan Morrow, 67, Canadian industrialist, died May 29 in Toronto. He was a director of International Paper Co., Canadian International Paper Co., Remington Rand Ltd., Loblaw Inc., and Canadian National Railways.

Arno W. Nickerson, retired New York chemical engineer, died in White Plains May 27. He was 61. A graduate of the University of Maine, he was at one time on the technical staff of Robert Gair Co. Inc., where he helped in the development of the process to convert waste paper into raw material for cardboard and paper.

Hugh F. Ferguson, owner of National Tube & Spool Co., died June 9 in Philadelphia. He was 57.

Martin L. C. Wilmarth, vice president and director of Imperial Paper & Color Corp., died at his Glens Falls, N.Y., home June 14. He was 76.

The Paper Industry Patent Reviews

MELVIN NORD*

Two-Stage Sulfite Pulping for Obtaining Concentrated Waste Liquor

In U.S. 2,639,986, issued May 26, 1953, to Gunnar Kyrklund and assigned to Kymin Osakeyhtio-Kymmene Aktiebolag, predigestion and final digestion steps are used for the formation of sulfite pulp. The cooking liquor from the final digestion of a preceding cook is mixed with the requisite amount of lime or other base and fortified with SO^2 to the required strength for use in the predigestion step. This predigestion is continued until the majority of the cellulose materials have dissolved, at which time the concentrated liquor is withdrawn for evaporation. Following withdrawal of this liquor, the necessary amount of fresh cooking acid is introduced into the cook and the final digestion continued. All danger of "burning" is thus eliminated, and yet the liquor going to the evaporator is high in concentration.

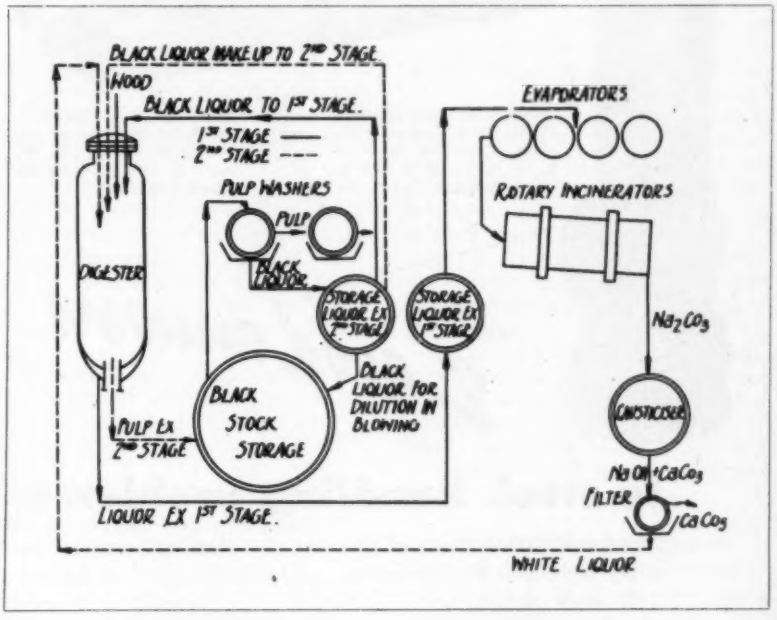
Acid-Resistant Wet Strength Paper

Paper stock is treated with a water-soluble condensation product of a phenol, formaldehyde, and a water-soluble salt of an amino-carboxylic acid in order to make an acid-resistant wet strength paper in U.S. 2,639,242. The patent was issued May 19, 1953, to Tzeng-Jiueq Suen and assigned to American Cyanamid Co.

As an example, 1 mol of phenol, 1.5 mols of formaldehyde in aqueous solution, 0.5 mol of beta-alanine, 1.2 mols of sodium hydroxide in 5N aqueous solution, and 77 parts of water are mixed together, heated under reflux for 35 minutes and then cooled to 25°C. The water-soluble resin thus produced has a Gardner-Holdt viscosity at 25°C. of Z1-Z2. The resin is then diluted with water to a 10 per cent solution. Unbleached kraft pulp is treated with the resin in an amount of 3 per cent of resin solids, based on the weight of dry pulp, together with 30 per cent of alum. A sheet is formed on a British Handsheet machine, and the formed sheet is cured at 105°C. to 110°C. for 2 minutes and at 260°F. for 10 minutes. The wet strength of the finished sheet having a basis weight of 45 lb. (25 in. x 40 in. — 500) is 4.8 lb. per inch.

Upon soaking the treated sheet of paper in an aqueous acid solution, such as a 5 per cent citric acid solution having a pH of 1.8 or a buffered solution of potassium acid phthalate and hydrochloric acid having a pH of 3.0 at 25°C. for a week or two, no substantial loss in wet strength is observed.

*Patent Attorney, 664 Putnam, Detroit, Mich.



Two-Stage Pulping Process

A two-stage pulping process, suitable for the production of paper pulp by the soda or sulfate (kraft) process, is described in U.S. 2,639,987. Liquor from the second stage is used to provide the alkali necessary for neutralizing the natural acidity of the wood in a subsequent first stage treatment. The patent was issued May 26, 1953, to Arthur Raymond Sloman and assigned to Associated Pulp & Paper Mills Ltd. The process is illustrated in the figure above.

The first-stage digestion involves cooking the wood in a closed vessel in black liquor at 150°-180°C., the caustic alkalinity of the black liquor being between 5 and 16 per cent (expressed as NaOH on oven-dry wood). From 80 to 100 per cent of the alkalinity of the black liquor is neutralized by the natural acidity of the wood. The exhausted liquor is then removed, and the wood charge is subjected to a second-stage delignification treatment by cooking in a white liquor of a predetermined alkalinity at 150°-180°C., to produce a pulp. Black liquor may also be added as "make-up" liquor in the second-stage treatment to make up the required volume, as in normal single-stage cooking. Cooking times average about ¼ hour and 2 hours for the first and second stages, respectively.

The liquor discharged from the first stage

Other Patents of Interest to the Paper Industry

Subject . . .	*Inventor or Assignee . . .*	*Patent No.*	*Date*
Diaphragm control for press roll assemblies	Beloit Iron Works	2,638,819	5/19/53
Machine for making corrugated paper	Samuel M. Langston Co.	2,638,962	"
Device for guiding paper into a dryer	AB Svenska Flaktfabriken	2,639,483	5/26/53
Manufacture of fiberboard of high density and strength	United States Gypsum Co.	2,639,989	"
Preparation of tanning agents from alkali-lignin	The Champion Paper and Fibre Co.	2,640,052	"
Molded pulp carton press	Shellmar Products Corp.	2,640,401-2	6/2/53
Continuous automatic straightening of a web of paper fed from a carrying roll	Baltimore Paper Co.	2,640,660	"
Method of oxidizing sodium sulfide to sodium sulfite for use of waste liquors in the sulfite cooking process	Robert S. Aries and Arthur Pollack	2,640,758	"
Manufacture of coated paper	Hercules Powder Co.	2,640,790-1	"
Method of fractionating pulp	Harold Sanford Hill	2,641,164	6/9/53
Paper with improved printing characteristics	The National Cash Register Co.	2,641,557	"

Where space is at a premium, Goulds Fig. 3115 vertical stock pump. Capacities to 2000 G. P. M., heads to 180 ft. Write for Bulletin 723.2.

Goulds Fig. 3105 heavy duty centrifugal stock pump. Capacities to 4000 G. P. M., heads to 200 ft. Write for Bulletin 723.1.

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to stock handling problems

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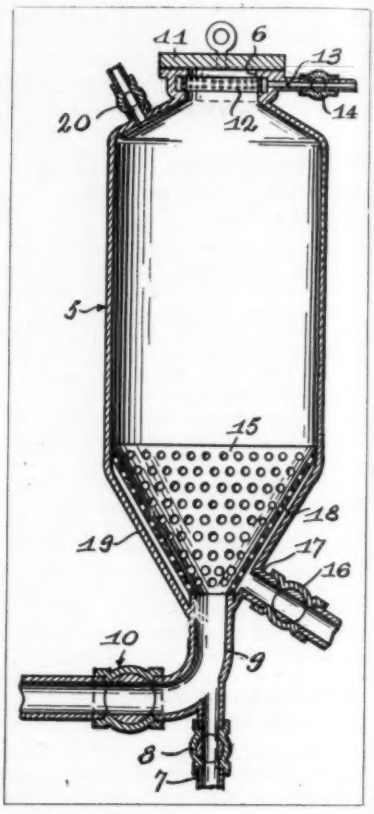
is particularly suited for the recovery of lignin. Also, the amount of alkali consumed is considerably reduced. It is further claimed that the pulp has improved characteristics compared with single-stage pulp.



Pretreatment Process for Production of Cellulose Pulp

U.S. 2,640,774, issued June 2, 1953, to James H. Ross, John S. Hart, Richard K. Strapp, and Otto Maass and assigned to Pulp & Paper Research Institute of Canada, utilizes a procedure whereby chips of varying moisture are brought to fiber saturation.

The wood chips are packed into a pressure vessel, such as that shown above, through the opening (6), and the cover (11) is closed. Steam is introduced through line 7 in order to expel the air through a strainer (12) and vent (13). When the air has been expelled, vent valve 14 is closed and steam is continued to be admitted until the desired maximum pressure (20 to 50 psi.) is reached. The steam is then shut off and the pressure is reduced as rapidly as possible to the minimum value (approximately atmospheric pressure) by exhausting the steam through a bottom strainer (15) and a drain valve (16) and opening the vent valve (14).

During the filling of the pressure vessel with steam, the wood chips are heated to the temperature of the surrounding steam which penetrates the chips to some extent. During the ensuing rapid reduction of the steam pressure to the lower limit, the water within the wood chips is flashed into steam and flows out of the chips with considerable velocity, thus purging the wood of air, free water and penetration-retarding solids.

The Paper Industry Safety News

Gulf States Paper Holds First Quarter Lead in Southern Safety Contest

Gulf States Paper Corp. at Tuscaloosa, Ala., led 57 member mills in the first quarter report of the Southern Pulp & Paper Safety Association. Figures released by the organization in June showed that Gulf States recorded a total of 842,807 man-hours of exposure without a disabling injury.

For the entire membership the injury frequency rate (injuries per 1,000,000 man-hours worked) was 7.72. This was down from the 9.78 of 1952 and the 10.13 of 1951.

Ten mills in addition to Gulf States reported no injuries for the quarter. They were as follows (man-hours of exposure in parentheses): Kimberly-Clark Corp., Memphis (668,852); Crossett Paper Mills, Crossett, Ark. (402,090); Brunswick Pulp & Paper Co., Brunswick, Ga. (334,129); National Container Corp., Jacksonville, Fla. (317,209); Macon Kraft Co., Macon, Ga. (311,414); The Flintkote Co., Meridian, Miss. (226,845); The Mead Corp., Sylva, N.C. (167,189); Certain-Teed Products Corp., Savannah, Ga. (115,449); The Mead Corp., Harriman, Tenn. (106,160), and Mead at Nashville, Tenn. (57,148).

Converting Industries

Among bag plants in the Converting Section, Union Bag & Paper Corp. at Savannah, Ga., led the 11 entrants with no disabling injuries in a total of 1,145,496 man-hours. Others with frequency rates of 0.00 were: International Paper Corp., Mobile, Ala. (319,601); Gulf States Paper Corp., Tuscaloosa, Ala. (318,759), and Hammond Bag & Paper Co., Pine Bluff, Ark. (54,561).

Bag plants reporting in the first quarter showed an over-all frequency rate of 10.48, up from 1952's 8.78. In 1951 the group recorded a rate of 12.12.

Box plants reporting to the association showed an over-all injury frequency rate in the first quarter of 11.71. For the year 1952 the figure was 13.96, and for 1951 it was 9.39.

Leader among box plants was National Container Corp.'s Southern Container Division at Jacksonville with one injury for 172,166 man-hours, or a frequency rate of 5.80. Next was Gaylord Container Corp. at Bogalusa, La., with three disabling injuries for 378,304 man-hours.

Four firms reported no disabling injuries in their woods operations during the quarter. They were Union Bag & Paper at Savannah (128,459); St. Regis Paper Co. at Pensacola, Fla. (54,737); Rayonier Inc. at Fernandina Beach, Fla. (38,609), and Mead at Lynchburg, Va. (960).

In woods operations the average injury frequency rate among the seven firms reporting was 24.16. In 1952 it was 20.75, and in 1951 it was 49.29.

1952 All-Industry Safety Record Shows Improvement; Pulp, Paper Down

Workers employed by member companies of the National Safety Council had the safest year on record in 1952. They had fewer on-the-job accidents, and the ones they did have were less serious.

Industrial injury rates for last year, released by the Council in advance of the 1953 edition of its annual statistical yearbook, "Accident Facts," show a substantial reduction in both frequency and severity from 1951. Thirty-one of the 40 basic industry classifications reduced their frequency rates, and 25 reduced severity rates.

The average accident frequency rate for employees in all industries submitting company reports to the Council, based on the number of disabling injuries per 1,000,000 man-hours, was 8.40 in 1952—a reduction of 7 per cent from the year before.

The communication industry again led all others. Its rate was 1.61, a 10 per cent reduction. Electrical equipment ranked second with 3.38, followed by the automobile industry with 3.62. Cement, third in 1951, dropped to sixth.

Among the 40 basic industries, pulp and paper ranked 23rd in frequency, with a rate of 10.06. For 1951 pulp and paper was in 24th place with a rate of 10.90. The industry showed an 8 per cent improvement.

Lumbering stayed at the bottom of the frequency list in 1952 with a 35.48 rate, but this represented an 18 per cent reduction. Underground coal mining remained in the next-to-last position with a 33.00 rate. Mining, except underground coal, was third from last, just below marine transportation.

Severity rate decreases

The average accident severity rate for all industries reporting to the Council, based on the number of days lost per 1,000 man-hours, was 0.88 last year—a decrease of 9 per cent from 1951.

Communications also had the lowest severity rate, 0.10, an 11 per cent increase from 1951. Wholesale and retail trade was second with 0.14, and tobacco ranked third with 0.23. Both aircraft manufacturing and the automobile industries had notable reductions in their severity rates, moving up to sixth and seventh places respectively.

Pulp and paper ranked 27th in severity, with a rate of 0.98, up 1 per cent from 1951, when its rate of 0.97 put it in 21st place.

In terms of severity, underground coal mining once more stayed at the bottom of the list, with the highest accident severity rate—6.19. Quarrying remained next to last, with 4.17, while lumbering continued to move up, with a 26 per cent reduction to 3.36.

111 Maintain Perfect Scores Through May in NSC Contest

According to the latest report issued by the National Safety Council, 111 contestants in the Paper Industry Safety Contest maintained perfect records through May. This compares with the 132 that had had unblemished records as of the end of April.

The three contestants working the most man-hours in May with perfect records were: Celotex Corp., Marrero, La.; West Virginia Pulp & Paper Co., Covington, Va., and The Mead Corp., Chillicothe, Ohio.

There is a total of 464 plants competing in the 1953 contest, with 383 of these reporting in May. Of these, 234—or 61 per cent—reported perfect scores for the month.

NYU to Offer Special Safety Training

New York University's Center for Safety Education will offer an evening program in industrial and traffic-accident prevention beginning September 21. Courses to be given include: Accident Prevention—Its Background, Objectives, and Relationships; the Philosophy and Basic Principles of Accident Prevention; Industrial Hazards — Mechanical and Personal Control Methods; Fire Prevention and Protection Inspection; Organization of Fleet Safety Programs; Vision in Industrial Safety and Motor Vehicle Operations; Effective Speaking in Accident Prevention, and Principles of Safety Inspection.

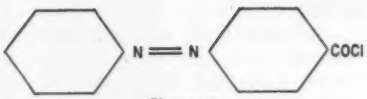


Figure 1

Fig. 2—Lamellae in a fiber ester of holocellulose from birch. Swelling medium: pyridine

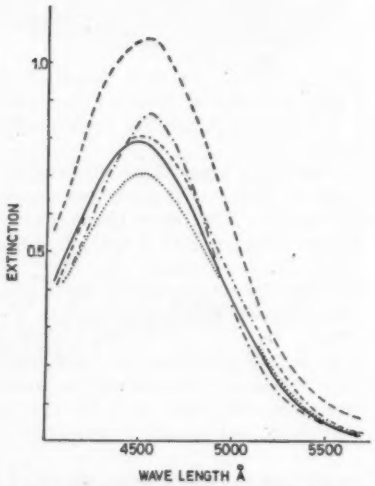


Fig. 3—Extinction curves for: (1) fiber esters from holocellulose from Swedish spruce - - - hot alkali treated holocellulose from Swedish spruce —·—·—·; (2) solutions of p-phenylazobenzoyl chloride ——, tri-p-phenylazobenzoate from glucose —·—·—·, penta-p-phenylazobenzoate from glucose . . . . . .

Treatment of carbohydrates in the cell wall prior to microspectrographic study

To permit adequate microspectrographic studies, lignin must first be removed as thoroughly as possible. Furthermore, because carbohydrates have no selective absorption in the wavelength range easily accessible to study (2000-7000 Ängstroms), they must be combined with a suitable light absorbing component which reacts quantitatively with cell wall polysaccharides. This is accomplished successfully by esterifying the fiber with p-phenylazo-benzoyl chloride (structure shown in Fig. 1).

It is shown from microscopic and x-ray studies that the main structure of the original fiber remains in the fiber ester (Fig. 2). The ester has the same general anisotropic (optical) features as have the original fibers. The general shape of the absorption curve for esterified fibers is the same as that for the light absorbing component in solution (with only a slight shift towards the longer wave lengths in the case of the esters) (cf. Fig. 3).

The influence of residual lignin (in the holocellulose) is discussed briefly. Saara Asunmaa and Paul W. Lange. *Svensk Papperstidn.*, 56, 85-90 (1953). (In English.)

Experiments with the Kohler-Molins folding tester

Studies are carried out at the Government Testing Institute in Sweden with the following types of machine-made papers: cable, writing, strong bond, document, tracing and a condenser paper.

The Köhler-Molins tester used in these experiments is described (cf. Fig. 1). In this apparatus, the "edges" over which the paper strip is folded are cylindrical and are set horizontally. The test strips hang vertically and are loaded with suitable weights (representing a definite percentage of the tensile strength of the sheet). The "folding angle" in either direction is standardized at 156°, and the radius of the cross-section of the cylindrical edges is 0.25 mm. [However, other folding angles and radii are also explored.]

A mathematical expression is formulated to indicate the movement of the load during the measurements. Another formula: $T = 100xt/r$ (T = increase in length; t = thickness, and r = radius of the cross-section of the folding edges) indicates the increase in length of the outer surface of the test strip (resulting from the test). Such an increase is greatly influenced by the thickness of the sheet. Thus, if t is greater than 0.01-0.02 mm. and $r = 0.25$ mm., T may become much greater than the elongation of the paper.

Initial folding of the test sheet may cause ruptures on the outer side of the folded sheet; it may also cause (outward) creasing of the inner surface (as shown in Fig. 2). Only very thin paper sheets can be folded at very small loads without this type of injury to the sheet. Paper quality and the size of the load will determine whether ruptures or creases dominate early in the test. Values for folding endurance are strongly influenced by the applied load. With a load over 25 per cent of the tensile strength, the tensions in the fold cause early ruptures, with little (if any) creasing.

It was shown that the linear relationship established by Wahlberg (*Svensk Papperstidn.*, **54**, 1951), between log. S (S = load in grams) and log. N (N = number of double folds) applies only within a limited range (in certain papers at least). Deviations occur when loads are small. Similarly, the angle coefficient in the formula proposed by Wahlberg for recalculating data from one load to another may be so different in different papers that the resulting data are unsatisfactory.

Papers made from the same stock and under similar conditions but with different thicknesses show folding endurances which, at the same load (800 gm.), decrease with increasing thickness. If a load is applied which is always proportional to the tensile strength of the folded strips (e.g., 5 per cent of the tensile), then the folding endurance increases with a decrease in the

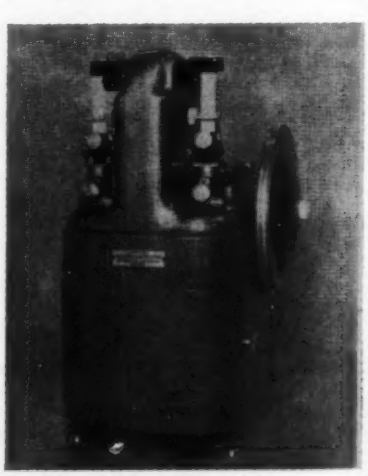


Fig. 1—Köhler-Molins folding apparatus for paper

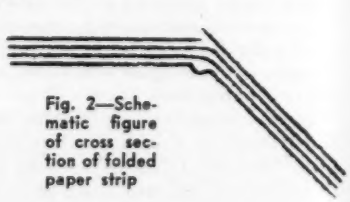


Fig. 2—Schematic figure of cross section of folded paper strip

thickness of the sheet. Folding endurance has usually been determined at a load of 800 gm. This technique results in showing a lower folding endurance, with lowered tensile strength (other things being equal). In practice, the folding endurance of a machine-made paper is usually higher in the machine-direction than in the cross-direction; this is also true for tensile strength. If, however, the folding endurance test is carried out at a load representing a definite percentage of the tensile (e.g., 5 per cent), then this relationship between machine- and cross-directions is usually reversed, probably due to the fact that stretch in the cross-direction is ordinarily higher than in the machine-direction.

A paper which shows a high double fold can be subjected to the test without immediate alteration of the tensile strength. The best basis for comparing folding endurance of different paper (or of the cross- and machine-directions of the *same* paper) seems to be the number of double folds at a load which is the same fraction of the tensile strength. This load should be so chosen that it lies above or below that which corresponds to the load at the smallest radius of curvature (*i.e.*, on the curve relating load with the number of double folds). The difficulties attending such measurements are discussed. One method of overcoming such difficulties is to make the comparison between different papers (or directions in the same paper) on the basis of the percentage tensile strength remaining *after* 1000 double folds have been made (at a load representing 5 per cent of the mean tensile strength of the unfolded strip).

The effects of changing the cross-section radius of the cylindrical folding edges of the apparatus are studied. In general, the smaller this radius (within the limits of 0.05 to 0.25 mm.), the lower is the number of double folds at a specific load. These differences may be important, especially when loads are low.

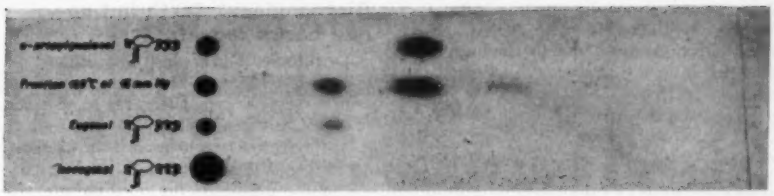
The size of the angle at which the strip is folded is also of marked importance. Actually, a decrease of one degree in this angle, for most types of paper, causes an average increase of nearly 2.5 per cent in the number of double folds (and, in some cases, higher).

The article contains numerous tables and graphs. The latter have English as well as Swedish captions. Sigurd Köhler. *Svensk Papperstidn.*, **56**, 157-72 (1953). (In Swedish, with English summary.)

Fusel oil from the alcohol produced from sulfite spent liquor

Previously, *n*-propylguaiacol (I) was isolated from a fusel oil emanating from the alcohol fermentation of a sulfite spent liquor. Since then, fusel oil fractions from 15 Finnish mills were studied, but only in one sample was I found to be present.

The present paper indicates that eugenol is also present in this fraction. This is shown in the paper chromatogram reproduced in the accompanying figure. The presence of eugenol is also shown by distillation in a "spinning band" column after the initial material has been subjected to alkaline fusion. Cis- and trans-isoeugenol are formed in this way. Eugenol is also identified as the 3, 5-di-nitrobenzoate (melting 128.6-9.2° (C.)



A third compound also present in the original fusel oil is presumably phenolic but has not been identified. Eleven references. Waldemar Jensen, Pekka Rinne and Mauri Vaino. *Paper and Timber*, **35**, (Special Issue), No. 4a, 135-8 (1953). (Original in Swedish, with an English summary.)

Fires and fire protection in the pulp and paper industries

This is the report of a technical inspector of the Mutual Industrial Fire Insurance Company of Helsinki, Finland. By making a statistical study limited to industrial fire insurance, the writer has given comparative tables showing the distribution of different fire causes in the pulp and paper industry and points out that certain of these causes seem to be specific for each branch of the industry.

For example, in the groundwood industry, ignition through friction of bearings appears to dominate and there is also a very high frequency of losses due to lightning. In the case of chemical pulp, ignition through careless welding operations is a common cause of fire, and the greatest frequency of losses is caused by explosions. In paper manufacture, overheated steam lines cause the greatest losses, but the greatest frequencies are those losses caused by the friction bearings and by lightning.

Of the three areas, the chemical pulp mills show the smallest loss ratio (based on the amount covered by insurance); mechanical pulp stands next, and paper mills are in third place. Losses are quite high in the storage of stocks, especially paper stocks. As a result, the writer concludes that the main purpose for improving fire protection is to make great losses impossible by building and sectioning well, so as to avoid concentrating too much stock in one storage block Bertele Aschan. *Paper and Timber*, **35**, (Special issue), No. 4a, 129-34 (1953). (In Swedish, with English summary.)

The question of "acid-soluble lignin"

During the past three years, the conviction has grown that in the usual Klason lignin determination, an appreciable amount of the lignin originally present in the wood is solubilized and lost, unless the filtrate is

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subjected to ultraviolet spectrographic absorption measurements. The subject, however, is controversial, and the findings (of high lignin losses) are not substantiated by the present authors.

In experimenting with the action of sulfuric acid both on glucose and (more especially) xylose, when the concentrated acid is diluted to 3 per cent and the mixture then examined spectrographically *without heating*, the ultraviolet absorption at 280 mμ is very low. This is the wave length at which there is a maximum lignin absorption. However, when these sugar solutions are *heated*, the absorption increases markedly, until in each case a very substantial absorption is noted.

Very similar effects are obtained with spruce, aspen and beechwood when treated with sulfuric acid, both with and without subsequent heating. The initial absorption at the "lignin maximum" is low and increases very rapidly with heating (as always occurs in the Klason lignin determination). Thus, the ultraviolet absorption measurements of the so-called soluble lignin gives no true index of the lignin that has actually entered solution. Some lignin may be lost, but, in the case of spruce, this loss is insignificant; and, in the case of the two hardwoods, it cannot exceed 1 to 1.3 per cent.

In the authors' opinion, then, the Klason lignin determination is substantially correct when applied to conifers, and entails relatively little loss when applied to the hardwoods. 12 references. Hermann Richtzenhain and Elisabeth Dryselius. *Svensk Papperstidn.*, **56**, 324-327 (1953). (In German, with English summary.)

Influence of long drying on paper quality

A paper made from a sulfite pulp after conditioning for 24 hours at 18-25°C. and 58-62 per cent relative humidity is then dried for periods ranging from 15 to 386 hours, at 95-100°C. Although this heating period does not affect the basis weight or the thickness of the sheet, it has a degradative effect on the cellulose. About 91 per cent of the initial bursting strength is lost at the end of the heating period; the tensile strength is lowered very seriously, both in the machine and in the cross-machine directions, and the folding endurance (even after about 173 hours) drops to zero. The elongation of the paper also drops sharply. F. A. M. Hoffmann. *Anais assoc. quim. Brasil*, **10**, 356-61 (1951) (through C. A., **47**, 5681 [1953]). (Original in Portuguese; abstract in English.)

Azo-dimethylaniline in fiber analysis

p,p'-Azodimethylaniline (I) is a selective stain for unbleached sulfite pulp (II). I forms a stable solution that can be used directly by spotting the paper sheet. With bleached kraft admixed with II, such a spot shows a reddish tinge with a dark border, and the presence of II can also be detected in unbleached kraft. Thus, the author has substantiated the findings of Green and Yorston (*Pulp Paper Mag. Can.*, **53**, No. 6, 133-4 [1952]). Heinz Fiedler. *Wochbl. Papierfabr.*, **81**, 47 (1953). (In German.)

Diatomaceous earth in paper and board manufacture

Despite its higher cost, the author indicates that diatomaceous earth shows certain advantages as a filler over some other loading materials. When 3-6 per cent is added to the beater, retention is substantially complete. Diatomaceous earth does not decrease the tensile or the bursting strength of the sheet, and, in some instances, seems to increase sheet strength. It improves the drainage of the stock, and permits a speed-up on the paper machine. Although the finished sheet is no more porous to water, it shows a higher air and vapor porosity. Diatomacaeous earth improves sheet formation and helps in the retention of shorter fibrils, of other fillers, and also of coloring matter.

Frequently the smoothness and uniformity of the sheet are improved by the addition of the diatomaceous earth, which also serves to increase the opacity. The filler also helps in the better distribution of rosin, pitch, paraffin and similar components; and the final sheet has an improved "handle." Diatomaceous earth, itself, has only a medium brightness, but since it can be used together with, and help retain, such pigments as titanium oxide, the final brightness of the sheet may reach 80-82 per cent. The author gives seven photomicrographs. C. Mareschal, *Assoc. tech. ind. papetiere, Bull., No.* 1, 1-6 (1953). (In French.)

Fiber felting and bonding

An illustrated lecture. The influences of felting (I) and of fiber bonding (II) on the strength properties of board are studied using spruce groundwood fiberboards (III) to which no synthetic resins have been added. The adverse effects of "steam pockets" between plies in III when cold pressing precedes hot pressing are discussed. Boards made from holocellulose (IV) are similar in appearance to III and, after hot pressing, show similar tensile strength on bending. However, when hemicelluloses are removed from IV, the resulting boards show poorer strength properties.

The authors assume that a continuous transition takes place through felting of fibrils in the molecular range of II of the macroscopic wood fibers and fiber bundles. In the molecular range, I appears to be of great importance. Hemicelluloses are the wood components responsible for bonding; and lignin, through its thermoplastic properties, acts as a hardening agent. A. Wacek and S. Meralla (Tech. Hochschule, Graz, Austria). *Holzforschung*, **6**, 65-70 (1952). (In German.)

Destruction of carbohydrates in the kraft cook

Laboratory scale digestions of pine and birchwood indicate that the hemicellulosic hexosans are dissolved from the wood rapidly and destroyed, whereas the dissolved pentosans are more resistant and form the main carbohydrate components of the black liquor. Apparently no monosaccharides or oligosaccharides appear in the liquors, but polysaccharides are frequently present and of these the xylans predominate.

The experiments are carried out in 15 l. digesters, using a liquor containing 180 gm. active alkali (as Na_2O) per kilo of chips, with a sulfidity of 25 per cent and a liquor ratio of 3.6 to 1. One hundred ml. of solution are withdrawn from the digester every hour, and a total of six samples are taken. These samples are immediately dialyzed in cellophane bags against running water and the solutions precipitated with acetic acid and alcohol. The precipitate is hydrolized, passed through a suitable Amberlite resin and evaporated and chromatographed.

The quantitative data are given in Tables I and II. Whereas appreciable amounts of glucan are removed in the case of pine, very little is removed in the cooks with birch. This is discussed. In either case, the most significant component is xylan, which is degraded only towards the end of the cook.

The marked differences in carbohydrate degradation in sulfite and in sulfate digestions are outlined. Six references. Jouko Saarnio and Charley Gustafsson. *Paper and Timber* (Finland), **35**, 65-6, 78 (1953). (In English.)

Table I. Pinewood. Amount of polysaccharides isolated from the cooking liquor expressed as mg./liter and as a percentage of the amount of the corresponding polysaccharides in the wood.

Cooking time, hours	Temperature °C.	mg./liter					Per Cent				
		Glucan	Galactan	Mannan	Araban	Xylan	Glucan	Galactan	Mannan	Araban	Xylan
1	80	40	38	10	6	6	+	0.5	+	0.1	+
2	111	285	85	35	35	60	0.2	0.9	0.2	0.7	0.3
3	142	415	+	+	295	490	0.3	+	+	4.7	2.1
4	173	735	60	135	390	1680	0.7	0.6	0.7	6.7	7.8
5	173	1050	150	+	900	3900	0.9	1.5	+	15.7	17.9
6	173	165	20	+	155	760	0.1	0.2	+	2.6	3.4

Table II. Birchwood. Amount of polysaccharides isolated from the cooking liquor expressed as mg./liter and as a percentage of the amount of the corresponding polysaccharides in the wood.

Cooking time, hours	Temperature °C.	mg./liter					Per Cent				
		Glucan	Galactan	Mannan	Araban	Xylan	Glucan	Galactan	Mannan	Araban	Xylan
1	80	–	–	–	–	7000	–	–	–	–	10.3
2	111	–	–	–	–	17000	–	–	–	–	24.1
3	142	–	–	–	+	22000	–	–	–	+	31.0
4	173	–	830	–	920	16750	–	17.2	–	39.1	24.1
5	173	+	475	+	475	8550	+	10.3	+	19.5	11.4
6	173	+	160	+	170	3170	+	3.4	+	8.0	4.6

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Note: **The above photograph and writeup appeared in a recent issue of the Fitchco-Deco News, published by and for the folks at Fitchburg Paper Company.**

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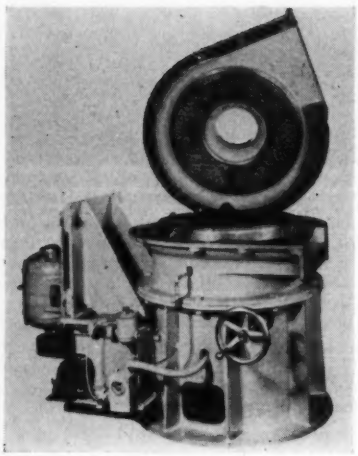
The Paper Industry New Products



Bleach mixer

A new bleach mixer capable of attaining higher brightness in paper pulp bleaching through more uniform distribution and bleaching of chemicals with fibers is now being manufactured. The principal application at the present time is with peroxide bleaching of pulp; although, it is considered equally suitable for adding other bleaching agents beside peroxide, such as chlorine, hypochlorite or caustic soda.

Known as the "015" high density mixer, it differs from the conventional mixer in that it has horizontal discs and a vertical shaft. Replaceable plates with triangular shaped teeth are provided. The discs are designed to hold interchangeable plates of various designs if the machine is used for purposes other than bleaching. *Jackson & Church Co., Saginaw, Mich.*

Electrostatic Charge Meter

A new instrument, known as the "Statigun," measures electrostatic charges, operating on the principle that a small voltage, proportional to that being measured, is induced by capacitive coupling onto the grid of an electrometer valve. The anode current of the valve is measured by an indicating instrument, calibrated to read in terms of the inducing voltage divided by the distance separating its source from the instrument. The measurement is, thus, of voltage gradient, or volts per foot.

The instrument consists of a pistol-like body and grip which contains the batteries, switches and adjusting rheostats and the indicating instrument. A detachable cylindrical part corresponding to the pistol barrel contains the hermetically-sealed electrometer valve, the capacitance coupling plate, a gravity-operated setting switch and a sliding member controlling the sensitivity.

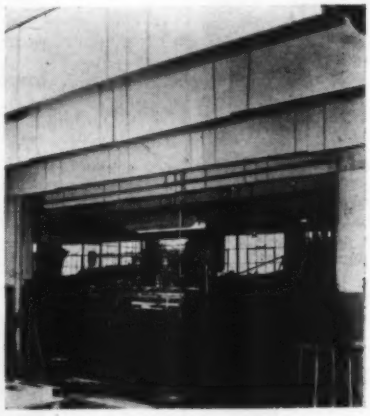
In operation, the instrument is pointed toward the object which is suspected of carrying electrostatic charges. The voltage gradient is read directly on the instrument dial which has a scale of 0-2000 v per ft. The adjustable sleeve on the instrument is calibrated to give readings 1, 10 and 100 times the scale reading. The reading is also multiplied with the distance in feet between the object and the instrument. *Distributed by Herman H. Sticht Co., Inc., 27 Park Place, New York, N.Y. Manufactured by Baldwin Instrument Co., Ltd., Dartford, Kent, England.*

Chemical proportioning pump

Displacement of all liquid in the cylinder at every stroke, with stroke adjustable while the pump is running, are outstanding features of a new chemical proportioning pump recently announced. A locking nut maintains the stroke adjustment.

Other features are as follows: both the stroke adjustment mechanism and the legible indicating scale are stationary while the pump is running; the piston is reciprocated by a positive mechanical linkage to the crank arm (it does not rely on a return spring); check valves can be removed easily for cleaning or replacement; powered by Class I, Group D explosion-proof motors.

Piston and cylinder assemblies of stainless steel (or other alloys) for 7500, 15,000 and 30,000 psi working pressure are readily interchangeable in the same pump frame. *American Instrument Co., Inc., Silver Spring, Md.*



Noise-stop baffles

Newly-developed, sound-absorbing, noncombustible Fiberglas baffles may be hung easily and quickly where a conventional acoustical ceiling is impractical because of obstructions like monorails, bus bars, sprinklers, lighting fixtures, pipes or girders.

These baffles are made of fine fibers of glass bonded with a thermosetting binder into a rigid panel, 24 in. wide, 48 in. long and 1½ in. thick. The baffle is enclosed in an opaque plastic film. Stainless steel wires, inserted through the board, are formed into a hook at the top and secured to the top and bottom of the baffle with stainless steel saddles. The baffles are washable and never need painting. Each baffle weighs only 6 lb. *Owens-Corning Fiberglas Corp., Toledo 1, Ohio.*

Fork truck attachment

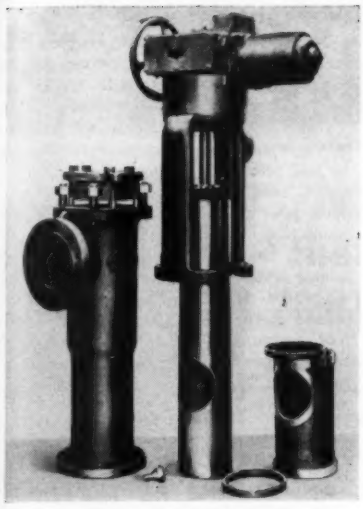
A new automatic attachment for drum and barrel-handling with Yale gasoline and electric fork trucks is now available.

This Marvel Lift-o-Matic attachment will handle any drum regardless of bead or rim size. It can be attached to the fork truck in a few minutes by the operator. No additional controls are required, since pick-up and release are effected through raising and lowering of the truck lift cylinder.

Drums can be tiered or removed at maximum fork height without the use of pallets. Because there are no side clamps or projections, drums can be picked up and and spotted in close position for maximum utilization of storage space. More than one attachment can be mounted on a truck for the multiple handling of drums. *Yale & Towne Mfg. Co., Philadelphia Div., Philadelphia 15, Pa.*

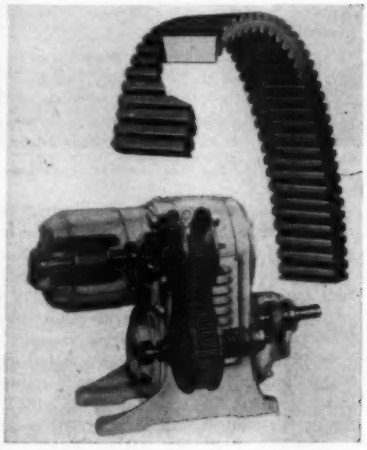
Refining machine

A machine, known as the Stuff-Maker, has been developed for jordaning to complement the Stock-Maker for beating and the Slush-Maker for pulping. This machine incorporates the best of typical jordan flow, filling and treatment characteristics into the basic framework of the Stock-Maker. By simple changes of fillings, housing and flow, the Stock-Maker for beating is transformed into the Stuff-Maker for jordaning. All the basic parts of the Stuff-Maker are identical with the Stock-Maker except the fillings and inlet-outlet casing. The new machine may be used by itself or to complement the beating treatment of Stock-Makers or other equipment. *Morden Machines Co., Corbett Bldg., Portland, Ore.*



Plunger for digester valves

Corrosion and wear, a costly and serious maintenance problem in pulp digester valves, has been materially reduced in Yarway seatless digester valves, with the use of a new stainless steel plunger material. This 17/4 PH stainless steel, a precipitation hardening type, has corrosion resistant properties approaching those of the austenitic (chrome nickel) stainless steel, and, in addition, has a hardness of 400 Brinell. Six-inch, 8-inch and 10-inch seatless digester blow valves (for remote electric or hydraulic operation) with plungers of this long wearing material are available. *Yarnall-Waring Co., Philadelphia 18, Pa.*



Double-ribbed V-belt

The most recent improvement in the application of V-belts to variable speed motors has been the perfection of a double-ribbed V-belt, which reduces internal friction and permits far greater flexibility, without sacrifice of strength.

By application of the double-ribbed design, replacing the single-ribbed belt, greater speed and smaller diameters can be combined. This, in turn, has permitted further design changes to develop greater horsepower within a smaller space than ever before. The result is maximum motor compactness. *U.S. Electrical Motors Inc., Box 2058, Los Angeles 54, Calif.*

Adhesive

The principal use of Adhesive No. 3143, an open-tack and pressure sensitive latex product, is for self-sealing purposes on paper bags, envelopes, boxes and cartons, particularly where economy and rapid production are important. The adhesive, which is applied to two surfaces, dries rapidly by air. By subsequent pressure of one coated surface to the other an immediate bond is formed. *Dennis Chemical Co., 2701 Papin St., St. Louis, Mo.*

Constant-frequency control

A new constant-frequency control designed to hold alternator frequency within 0.001 per cent on motor-generator sets supplying up to 10 kw of power has recently been developed.

Designed for industrial and laboratory applications where close frequency control is necessary, the equipment is available in 50, 60, and 400 cycles per sec. standard in single or three phase. Non-standard frequencies are available on special order.

The electronic control consists basically of a tuning fork and a phase comparator enclosed in a case approximately 6 x 24 x 36 in. It operates on 115 v, 50/60 cycle power, using approximately 150 w. The motor-generator requires 115/230 v dc supply. Other ratings are available on special order. *Special Products Section, General Electric Co., Schenectady 5, N. Y.*

High pressure, low flow control valve

The new "Wee Willie" high pressure, low flow control valve is pneumatically controlled and is specifically adapted to pilot plant operation.

Standard models are available with working pressure ranges of 10,000 psi and 30,000 psi, with special assemblies up to 50,000 psi, and may be said to control flow rates in drops of fluid at differential pressures to 10,000 psi. Sizes range from ⅛ through ½ in., with screw, welding, Superpressure, and Autoclave End connections available.

The "Wee Willie" valve assembly features travel limit stops with built-in reversing arrangement for changing from air-to-open and air-to-close. *Annin Co., Union Pacific & Spence, Los Angles 23, Calif.*

Thermostat

A redesigned midget thermostat, whose heat-sensitive shell has an outside diameter of only ¼ in., has recently been released specifically for those applications in which precision temperature control or overheat detection must be provided in solids, liquids or gases where space is at a premium.

The midget Thermoswitch is adjusted and sealed at the factory to any temperature set-point in the range from —50°F. to 450°F. and has an inherent sensitivity of 0.1°F. Although the volume of its shell is only 1/12 that of standard Fenwal units, the midget unit is claimed to retain such operating characteristics as built-in temperature anticipation, fast reaction time, high resistance to mechanical vibration and shock, short heat transfer path, wide operating range and uniform sensitivity. *Fenwal Inc. Ashland, Mass.*

Moisture applicator

A recent development of interest to papermakers and converters is a means for eliminating separate operations required to add moisture to the sheet about to be calendered. This is accomplished by a machine known as the moisture applicator.

Mounted on the upper portion of the calender frames and driven by the top calender roll, this machine does the work here, rather than elsewhere on the floor as a separate operation. In short, this means "in line" moisture application and calendering.

Designed for actual production speeds of 1000 fpm on a 25 lb. sulfite sheet, this compact, 3-roll, self-contained unit is capable of applying controlled moisture between 9 to 11 per cent maximum, down to as low as 3 per cent minimum, maintaining a tolerance of ½ of 1 per cent. The machine is also capable of maintaining less than ½ per cent variation across the full 52 in. web for which it was designed.

The moisture applicator offers the advantages of less web handling, resulting in less change of web breaks and subsequent waste. It is placed into operation with no sacrifice to calender speeds and is readily accessible for threading and quick cleanup. *Black-Clawson Co., Dilts Machine Works Div., Fulton, N.Y.*

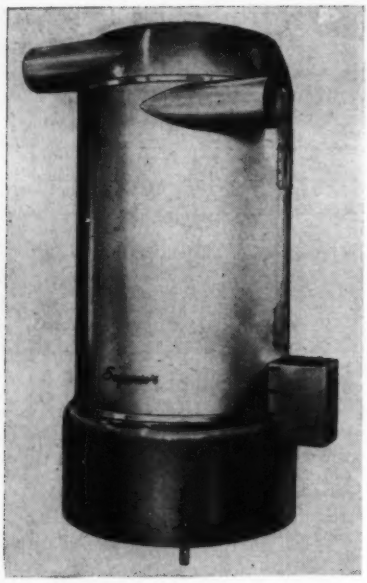
Electronic pyrometer controllers

A new line of free-vane electronic pyrometer controllers actuates relays, electric contactors, solenoid valves and motor valves to provide close temperature control of a wide variety of furnaces, ovens, kilns and other heating equipment.

These controllers feature a unique electronic control system based on the frequency modulation principle, a newly-developed millivoltmeter mechanism, and unit plug-in construction.

The basic model can be used for low-open, high-open, and low-high control. A model with an additional plug-in unit makes possible proportional current input to provide practically straight-line control of many heating appliances. A double control unit model is offered to provide low-open-high or low-normal-high control.

All models are available with thermocouple failsafe protection to protect the heating appliance in case of thermocouple burn-out or other failure. The controllers are made in a wide selection of temperature ranges from 0-400°F. to 0-3000°F. *Bristol Co., Waterbury 20, Conn.*



Air centrifuge

A new machine for continuous dust removal and particle recovery from air and gas works on a new patented impelled centrifuge principle. This air centrifuge, as it is called, operates with high efficiency in the very small particle size ranges, according to the manufacturer. It is continuous and non-varying over a wide variety of temperature and humidity conditions. Temperatures range up to 200 degrees higher than standard filters, it is claimed.

The compact machine, which stands just over 7 ft. high and is 42 in. in diameter, is made of steel and operates with only one main moving part. It is adaptable to plant air flow systems wherever industrial processes involve machines such as grinders, pulverizers, dryers, roll stands, purifiers, solvent extractors, mixers, open conveyors, blenders, etc.

A small portable model air centrifuge is also being introduced. *Superior Separator Co., Hopkins, Minn.*

Nine Publications for Papermakers

Pulp and Paper, Volume I	$15.00
Pulp and Paper, Volume II	15.00
Modern Pulp and Paper Making	9.50
Procedure Handbook of Arc Welding	2.00
Outside U.S.A.	2.50
Drying of Paper on the Machine	1.50
Notes and Observation on Beaters	1.00
Lessons in Papermaking—Part I	1.00
Lessons in Papermaking—Part 2	1.00
Trouble on the Paper Machine	.75
Pulp Bleaching (A Symposium)	.50
Technology of Papermaking Fibres	.50

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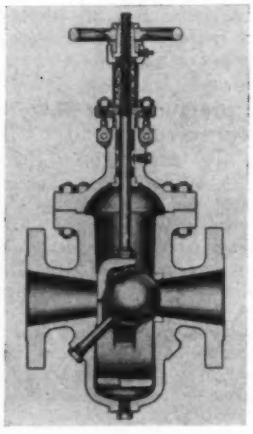
431 S. Dearborn Street, Chicago 5, Illinois

Chlorine dispenser

A new vacuum-type solution-feed chlorine dispenser, including corrosion-resistant materials unaffected by either dry or wet chlorine gas, is now offered with either manual or automatic proportioning control.

Large diaphragm areas in the regulators and minimum friction in the few moving parts provide constant chlorine flow rate in the manual-reset model and accurate ratioing in the automatic proportioning dispensers, according to the manufacturers. Since chlorine flow rate is changed by a simple valve setting while the vacuum is held constant, the dispenser may be readily adapted for remote setting with an air-operated diaphragm motor valve in accordance with standard industrial control methods and with no need for expensive and special devices.

Among the safety measures incorporated in the dispenser is the vacuum breaker which prevents flooding of the system with water during shutdown. The ejector, vacuum regulator, and vacuum breaker are all connected to the gas vent. The vacuum breaker, vacuum regulator, and differential pressure regulator have interchangeable components. *Fischer & Porter Co., 10 Jacksonville Rd., Hatboro, Pa.*



Venturi ball valves

A new line of valves, operating on a unique principle, has been announced. The disc in these Crane-Paul valves, instead of being a conventional shape, is a ball. This ball is not attached directly to the stem, but rides in a cage which is attached to the stem by a tee-head slotted construction.

In operation, the ball is moved to and from the center of flow and rolls into and out of the body seat. The ball disc is mechanically locked in the closed position by a wedging member on the cage. In moving to the fully open position, the ball rolls out of the seat and up, until it is lined up vertically with the stem and is carried out of the path of flow.

The design, it is claimed, provides unusually accurate flow control with a minimum of wire-drawing, straight-through flow with much lower pressure drop than that through a globe valve, absolutely tight shut-off, easy operation, and complete freedom from vibration or chattering, regardless of position of the ball disc. *Crane Co., 836 S. Michigan Ave., Chicago 5, Ill.*

Automatic couplers

Three types of automatic couplers have been added to Towmotor optional original equipment available on lift trucks and tractors.

Installed as replacements for standard towing eyes, these couplers speed the pick-up and release of trailers used with Towmotor units. Each type is built with an open jaw which automatically makes the connection when entered by the trailer coupler. One type provides a hand-operated release lever, another employs a foot lever, while the third permits operation of the release mechanism, either manually or by foot pressure. Two of the couplers are spring-actuated and the other utilizes a ball-type lock. *Towmotor Corp., 1226 E. 152 St., Cleveland 10, Ohio.*

New Products Briefs . . . . . .

SONIC FILTER—An improved "Sonic Ear-Valv" made possible by a new silicon rubber ear insert tip is now available. This new insert tip offers many advantages over the original gum rubber tip by being softer and more comfortable to wear. It will endure extremes of heat and cold and is more resistant to skin oils and ear wax. The "Sonic Ear-Valv" acts as a protective ear drum by removing the harmful loud noise while allowing the ear canal to remain open to receive air and permit hearing of ordinary voice level sounds. *Sigma Engineering Co., 1491 N. Vine St., Los Angeles 28, Calif.*

ROTARY DISPLACEMENT METER—A new 2 BC Rotocycle stainless steel industrial meter has been developed to handle corrosive liquids. Based on the patented Rotocycle principle, this new rotary displacement meter features a maximum capacity of 100 gal. per minute at a working pressure of 125 lb. psi. All materials in contact with corrosive liquids are of stainless steel. *Rockwell Mfg. Co., 400 N. Lexington Ave., Pittsburgh 8, Pa.*

INDUSTRIAL LUMINAIRE—An industrial luminaire, type SDP, which provides more comfortable seeing conditions by means of an upward component is now available. It uses two slimline lamps of 38, 58, or 75 w each. The upward component, which distributes 23 per cent of the light toward the ceiling, eliminates the severe contrast between bright luminaires and dark ceiling. Also, the use of soft colors to produce better eye-comfort has been greatly aided. *Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.*

PORTABLE ROLLER CONVEYORS—A new line of lightweight portable roller conveyors has been added to the list of MHS pre-engineered materials handling equipment. This new series of roller gravity conveyor carries the number 2520, which indicates a 2½ in. channel and 2 in. diameter rollers. The frame is composed of a 2½ in. channel of 12 gauge material secured by four cross braces of ½ x ½ x 3/16 angle iron. The rollers are 2 in. diameter, 12 gauge, with formed ends, and receive a machine bearing. *Mechanical Handling Systems, Inc., 4601 Nancy Ave., Detroit 12, Mich.*

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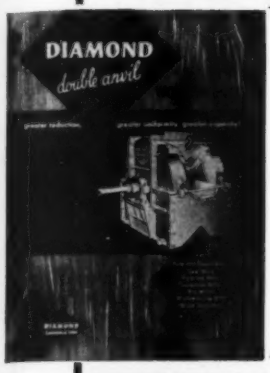

MORE than a new BULLETIN . . .

an engineering service to solve your WOOD REDUCTION PROBLEMS

DIAMOND'S *Double Anvil line of* **WOOD HOGS**

is described in Bulletin H-53. Four sizes with capacities from 6 to 36 tons/hr. handle any job of wood reduction on a production basis.

DIAMOND'S Engineering Service will help you select the Hog that will best serve your production requirements. Either reduction of wood waste into chips for fuel or commercial use, or the production of paper pulp chips from scrap and/or waste wood.

Write for Bulletin H-53. Send your specifications for prompt engineering service.

DIAMOND IRON WORKS, INC.
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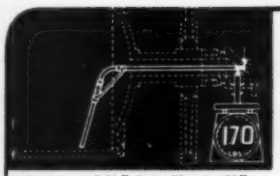
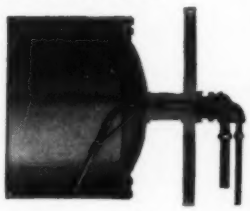


Reaction of ¾" Auto-Flex in 48" dia. dryer. Very low leverage.

Reaction of ¾" ordinary bent pipe. Syphon in 48" dia. dryer. High leverage.

THIS SYPHON HOLDS ITS POSITION AND SERVES INDEFINITELY

Midwest Auto-Flex syphons have been on the market for years and many thousands are in service for two very excellent reasons — they hold their position — they wear indefinitely.

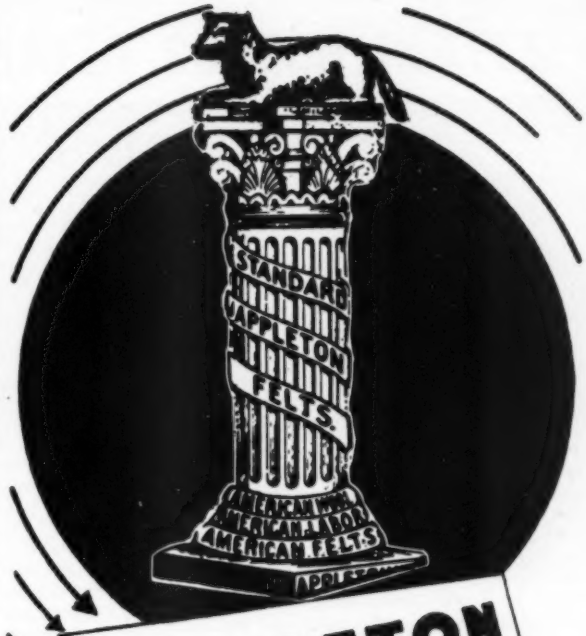


1. The spring and brace holds the end of the pipe at the proper distance from the bottom of the dryer. It cannot take any other position—hence, proper water and air removal.

2. The cantilever leverage exerted is lower than with bent pipe syphons, only 170# vs 354#. It clears instead of dragging on the journal and rapidly wearing out.

Order a get acquainted dozen. Performance guaranteed.

MIDWEST · FULTON MACHINE COMPANY
DAYTON, OHIO



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Design
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The Paper Industry New Literature

Books

PAPER CHROMATOGRAPHY, A Laboratory Manual. By Richard J. Block, Raymond LeStrange and Gunter Zweig. Published by Academic Press Inc., 125 East 23rd St., New York 10, N.Y. 6¼ x 9¼. 195 pages. $4.50.

This book discusses and evaluates some of the more important techniques developed in paper chromatography. The authors state that no attempt has been made to list all the references in which paper chromatography has been used but, rather, an effort has been made to write a practical manual in which tried and proven procedures, employing relatively simple equipment and available reagents, are summarized.

A brief introductory chapter is followed by a chapter on theory. The book goes on to present nine general methods used in paper chromatography, including a detailed description of the most important apparatus and a section on experimental technique. Chapter IV gives an account of seven general methods employed in quantitative and semi-quantitative analyses based on paper chromatographs. Some of the many experiments on the separation and determination of amino acids and peptides which have been published since 1944 are summarized in the fifth chapter.

The next seven chapters cover carbohydrates; aliphatic acids and steroids; purines, pyrimidines, and related substances; phenols, aromatic acids, and porphyrins; miscellaneous organic substances; antibiotics and vitamins, and inorganic separations. Included are a bibliography, author index and subject index.

MANUFACTURE AND TESTING OF PAPER AND BOARD. Vol. 3 of "Pulp and Paper Manufacture." Prepared under the direction of the Joint Textbook Committee of the Paper Industry of the U.S. and Canada. J. Newell Stephenson, Editor-in-Chief. Published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N.Y. 6½ x 9¼. 945 pages. $11.00.

While essentially a new volume, much of the material offered is based on topics covered in Volume V of a previous series known as "The Manufacture of Pulp and Paper," and reintegrated with modern methods and procedures.

Written by leading paper mill technologists, who are recognized authorities on the various subjects treated, this book describes in the first chapter, the machinery that transforms the suspension of prepared cellulose fibers into a variety of paper and paperboard grades. This chapter is divided into nine parts: auxiliary apparatus and operations preliminary to paper machines; the fourdrinier section; press part; cylinder machines, vats, and presses; the dryer part; calenders, slitters, and winders; the paper machine drive; specialty paper-making machines, and paper-production calculations. An appendix is included at the end of this chapter, presenting a number of items which either apply at several points in the chapter, or are of somewhat indefinite application, or have become available only since the text for this chapter was completed.

Chapters two and three cover handmade papers and the finishing of paper. The following chapter on coated papers is divided into three sections: the coating process; gummed papers, and waxed and lacquer-coated papers. Paper testing is covered in the final chapter, which includes sections on physical tests, microscopy of paper, and chemical tests.

New material in this volume covers consistency regulators, screens, temperature and pH control of stock, new paper machine drives, control of press roll pressures and paper drives, new designs of paper and board machines, improved processes of casting paper, and new equipment for finishing and testing paper. Included are 225 new illustrations specially drawn for the book.

CELLULOSE: THE CHEMICAL THAT GROWS. By Williams Haynes. Published by Doubleday & Co., Inc., Garden City, N.Y. 5¾ x 8½. 386 pages. $4.00.

In this history of fact and legend, the author relates the story of the cellulose industry from the age of Marco Polo to the present and records the paradoxical and complex qualities of this useful chemical. It is the story of our most modern products and the products of the future.

All technical terms have been defined in the text, and, as an added convenience, a glossary of technical, scientific, and commercial words and terms appears in the back of the book. A chronology of events and discoveries in the front of the book is useful in timing the cellulose story, helping the reader to keep straight the sequence of cause and effect. Seventeen appendices of statistical and technical data are included, as are numerous halftone illustrations.

TECHNIQUES OF PLANT MAINTENANCE—1953. Published by Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N.Y. 8½ x 11. 288 pages. $6.00, postpaid.

This volume contains the text of 61 sessions on various aspects of maintenance and plant engineering held in Cleveland recently. One of the highlights of the book is the publication of 859 questions and answers at the general and sectional conferences. Thousands of other questions and discussions, submitted at the 21 roundtables, are summarized in narrative style. Also presented are text of 20 papers read. One of the new features is a cross section of opinion on how the various aspects of maintenance should be handled. Illustrations include 41 charts.

Separate roundtables were devoted to the automotive, chemical, electrical, food, foundries, paper, petroleum, printing and binding, rubber, steel and textile industries. Ten other roundtables considered "Area vs. Centralized Maintenance," "Dealing with Union Labor," "Incentives and Work Measurement," "Lighting," "Lubrication," "Project Control," "Pumps and Piping," "Sanitation," "Selling Management on the Maintenance Program" and "Maintenance Stores."

General sessions were "Maintenance Essentials" and "Growing Pains of an Engineering Maintenance Organization." Sectional conferences covered maintenance of buildings, mechanical equipment, electrical equipment, and power plants, "Works Engineering Organization," "Maintenance Operating Policies," "Preventive Maintenance," "Corrosion Prevention and Control," as well as five sessions on maintenance, divided according to the size of the plant, and three sessions on plant engineering, similarly divided.

Booklets and Pamphlets

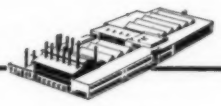
USES OF PERSULFATES (Bulletin No. 34). Published by Buffalo Electro-Chemical Co., Inc., Station B, Buffalo 7, N.Y. 8½ x 11. 19 pages. A bibliography of the properties and uses of persulfates is presented in this bulletin. Among many fields discussed are biological chemistry, cellulose chemistry, fur bleaching, polymerization, textiles, organics, and the rubber industry. Approximately 100 references are cited.

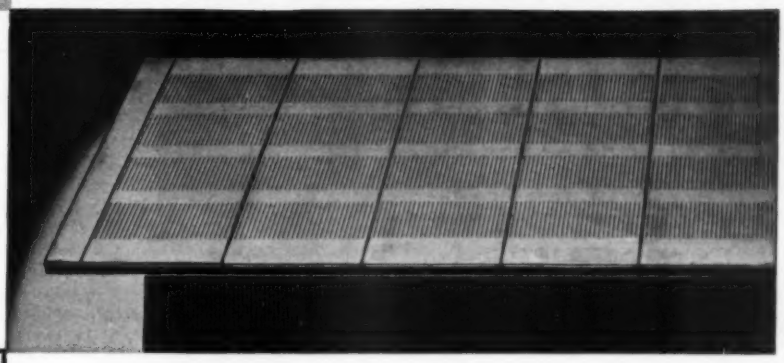
HIGH DENSITY BLEACHING PROCESSES (Bulletin No. 48). Published by Electro-Chemical Co., Inc., Station B, Buffalo 7, N. Y. 8½ x 11. 31 pages. Various process applications for groundwood sulfite, sulfate, soda and other pulp types are cited. Becco's own high-density processes and equipment used for steeping, steam bleaching, pulp dryer steeping and other techniques are described. Various tables, eleven drawings and a bibliography supplement the text of this bulletin.

ANNUAL REPORT 1952, NATIONAL BUREAU OF STANDARDS (NBS Miscellaneous Publication 207). Published by the National Bureau of Standards, U. S. Department of Commerce, Washington 25, D.C. 89 pages. 30 cents. (Order from Government Printing Office, Washington 25, D. C.) Summarizing scientific and engineering investigations conducted by NBS during the

MAGNUS THIN-SHEET SCREEN PLATES

for
High Sustained Yield
of
CLEANER PULP





MAGNUS METAL CORPORATION
Fitchburg, Massachusetts
Subsidiary of **National Lead Company**

Metalworkers for the Paper Trade

SCREEN PLATES: BRONZE, CHROME NICKEL-STEEL, AND INCONEL

VALVES: GATE, SWING CHECK, BLOW, GLOBE, ANGLE AND "Y"

Magnus screen plates, made of chrome-nickel-steel or inconel, have a high-strength, thin sheet design that's specially engineered for maximum flow. About 40,000 of these plates are now in service, with performance records that prove these three important advantages:

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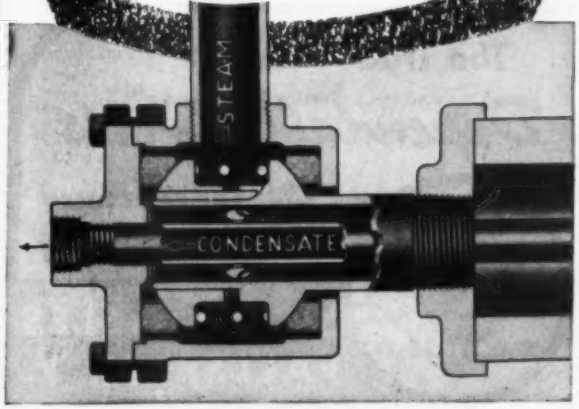

fiscal year 1952, this booklet contains accounts of current activities, as well as more detailed descriptions of representative projects. Twenty-eight halftone illustrations are included.

LIST OF PUBLICATIONS JULY 1 TO DECEMBER 31, 1952. Published by Forest Products Laboratory, Forest Service, U. S. Department of Agriculture, Madison 5, Wis. 5½ x 8. 12 pages. The name of the article, the author, the publication in which it appeared, and a short description of the article are grouped under the following classifications: Chemistry of Wood and Derived Products; Glues, Glued Stock, Plywood, and Veneer; Mechanical Properties; Packaging; Paints and Finishes; Pathology; Pulp and Paper; Sandwich; Seasoning; Wood in Construction; Wood Preservation; Wood Structure; Wood Utilization, Logging, and Milling, and Miscellaneous.

UNIT FIRST AID KITS (Data Sheet D-202). Published by National Safety Council, 425 North Michigan Ave., Chicago 11, Ill. 17 cents. To assist companies in the selection of units for first aid kits, this data sheet includes a chart giving recommendations for some 25 occupations. The assortments of treatment and dressings are based on surveys, trade association recommendations, state regulations or National Safety Council recommendations as to what items are most generally used in a given industry. A simplified accident and first aid report form, as well as valuable information on first aid training and inspection and control, is included.

HANDBOOK OF ACCIDENT PREVENTION. Published by National Safety Council, 425 North Michigan Ave., Chicago 11, Ill. 5⅞ x 8⅞. 93 pages. This handbook is written for the manager of a small business or for those supervisors of single departments in larger organizations whose responsibilities are similar. The first chapter illustrates the simplicity of starting accident prevention work in any business. The remaining chapters, which discuss the conditions to be controlled for safe operation, cover the physical plant, storage and handling, machine guarding, hand and portable power tools, special hazards, fire prevention and control, personal protective equipment, and industrial health and first aid. The final chapter lists and describes consulting services.

EFFECTS OF VELOCITY ON CORROSION BY WATER. By H. R. Copson. Published by International Nickel Co., Inc., Dept. EZ, New York 5, N.Y. 8 x 11¼. 8 pages. Reprinted from *Industrial and Engineering Chemistry*, August 1952, this is a general review of 56 technical articles and pertinent unpublished data, with emphasis on iron, zinc, copper and their alloys. Twelve charts, tables and illustrations are included.

TAPE NUMBER DICTIONARY (P3-4). Published by Polyken Industrial Tape, 222 W. Adams St., Chicago 6, Ill. 3½ x 6¾. 14 pages. 25 cents. Information on hundreds of pressure sensitive tapes has been gathered and reproduced in this convenient pocket-size booklet. Each tape number is listed in sequence with the manufacturer's name. For each tape there is included a description of its construction.

APPLICATION OF POWER MEASUREMENT TRANSDUCERS TO PROCESS CONTROL. (Bulletin No. 15-16). By M. C. Carpenter and H. C. Streitz. Published by Minneapolis-Honeywell Regulator Co., Station 64, Industrial Div., Wayne and Windrim Aves., Philadelphia 44, Pa. 8¾ x 11¼. 12 pages. This booklet contains technical data on the application of power measurement transducers to process control. Application data on all subjects such as salt operation, pulverizing, clay mixing, sodium production and measurement and control of ac power, plus the measurement and control of dc power, is covered. Engineering descriptions of applications of thermal converters, solenoid-plunger ammeter, torquemeter, vacuum thermocouple, rectifying current system, precision shunt, saturable reactor and magnetic amplifier are given. Diagrams, tables of characteristics, and mathematical formulae are included.

INSPECTION IN INDUSTRY (PB 106471). Published by Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. 84 pages. 75 cents. This is a report by a British productivity team which studied practices throughout U. S. industry. It reviews the most advanced inspection practices found in American industry under these headings: Principles of Inspection; Inspection and Management; Techniques of Inspection; Tools of Inspection; Personnel for Inspection; Labor Management Relations; Military Inspection and Industry, and Some Special (inspection) Techniques.

1952 ANNUAL REPORT. Published by American Forest Products Industries, 1816 N St., N.W., Washington 6, D.C. 16 pages. This publication reviews the forestry, educational and informational activities of the industry-sponsored organization during the past year. It gives detailed reports on the Keep America Green forest fire prevention program, the Tree Farm System, and AFPI's school program.

Manufacturers' Publications

Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY *lists the following catalogues, bulletins and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.*

Power Conversion Units. General Electric Co., Schenectady 5, N. Y.—Designated as GEA-5658B, a new 8-page bulletin on the complete line of General Electric metallic rectifier power conversion units lists the design features, advantages, description, performance, circuits, dimensions, and ratings for the complete line, rated from 125 to 250 v dc. A guide is also provided as an aid in preparing contract specifications which entail G-E dc power supplies and exciters. Drawings show the outline dimensions of the power conversion units.

Pneumatic Tube System. Lamson Corp., Syracuse 1, N. Y.—5-page Bulletin A-101-52 describes the engineering features of the Lamson Airtube automatic switch system. It contains a detailed analysis of this fully automatic pneumatic tube system for transporting messages, punch cards, small tools, laboratory samples or other small articles from one point to another. The advantages of this system are pointed out.

Rubber Lined Sand Pumps. Denver Equipment Co., 1400 17th St., Denver, Colo.—20-page Bulletin P9-B8 describes rubber lined sand pumps. It lists all parts and shows them by sectional views. The bulletin lists clearance and foundation dimensions, specific gravity of pulps, friction of water in pipes, SRL pump capacities, a motor selection table, and installation and maintenance instructions for SRL and SRL-C pumps. Case histories are given.

Corrosion-Resistant Fastenings. H. M. Harper Co., 8251 Lehigh Ave., Morton Grove, Ill.—Described and illustrated in a new pocket-size, accordion-type folder are the major fastenings manufactured by Harper. Available metals and sizes of bolts, nuts, screws, washers, rivets and specials are included.

Polyester Film. E. I. du Pont de Nemours & Co., Film Dept., Sales Development & Technical Service Section, Wilmington 98, Del.—A new technical bulletin containing up-to-date information on the physical, electrical and chemical properties of "Mylar" polyester

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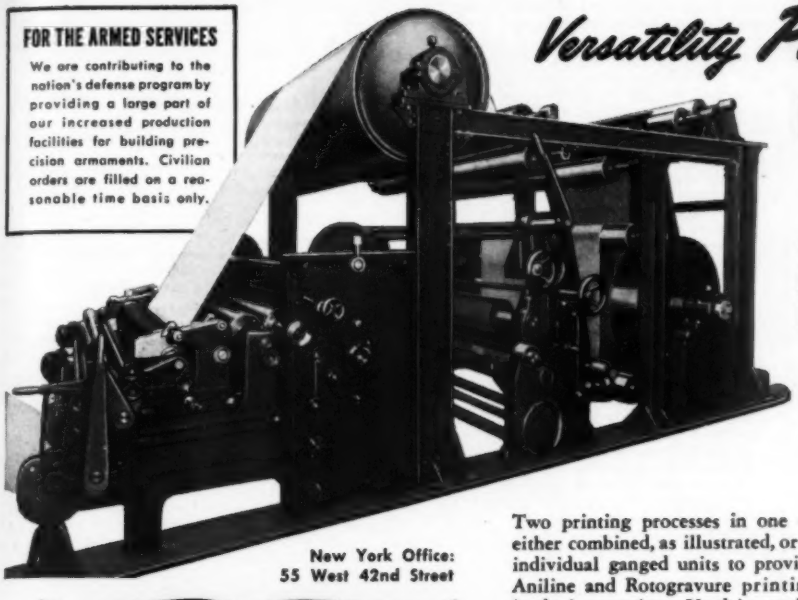

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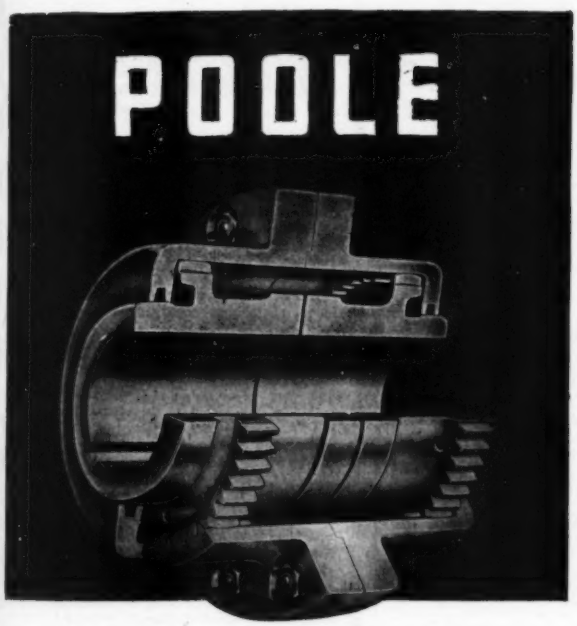

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film, and suggested applications, has recently been issued. First of a series to be issued on "Mylar," the new bulletin (No. 1-2-53) runs 14 pages, complete with charts, diagrams, and tables. In addition to a detailed table on the physical properties of "Mylar," the bulletin compares these properties with those of other Du Pont films—cellophane, polyethylene, and acetate.

Synthetic Methanol. Commercial Solvents Corp., Industrial Chemicals Dept., 260 Madison Ave., New York 16, N. Y.—This 30-page booklet on synthetic methanol contains sections on specifications; chemical properties; physical properties; uses; toxicology and health hazards; shipping, handling and storage, and specification test methods. Twenty-two tables are included. Three graphs show densities of methanol-water solutions; resultant volume when methanol and water are mixed; and freezing points of methanol-water solutions, per cent by weight and by volume. A nomograph for use in increasing concentration of methanol-water solutions is also given.

Static Alarm Systems. John Hewson Co. 106 Water St., New York 5, N. Y.—This new report, "New Static Alarm Systems—Fire Protection for Industry," describes a static alarm system which protects the U. S. Naval Ammunition Depot at Crane, Ind. The paper outlines the problem of preventing explosions and fires caused by static, gives details about the installation which warns of the presence of dangerous static, and describes the method of operation.

Controllers. Bristol Co., Waterbury 20, Conn.—Bulletin No. A123 describes Bristol's controllers used on DeZurik consistency regulators.

Dampers & Damper Operators. Minneapolis-Honeywell Regulator Co., Station 213, Industrial Div., Wayne & Windrim Aves., Philadelphia 44, Pa.—12-page Catalogue 8502 describes louver, round, mixing, outlet and fire dampers for regulation of air flow in industrial applications. Also described are electric, pneumatic and manual damper operators. Included are application data, velocity-pressure drop charts, and damper ratings for electric and pneumatic operators.

Starter Selection. Allis-Chalmers Mfg. Co., 991 S. 70th St., Milwaukee, Wis.—Tips on induction motors rated up to 600 hp at 600v or less are contained in a new 4-page bulletin (14B7733). Information included in the bulletin tells how to select the proper type starter, enclosure and operating arrangement and explains how to determine whether a full or reduced voltage starter should be used. An explanation of two or three-wire control and hints on the selection of heater elements for overload relays are also given, along with a cage motor starter selection chart.

Knife Grinder. Samuel C. Rogers & Co., 183-205 Dutton Ave., Buffalo 11, N.Y.—This 2-page bulletin presents a large photograph of the Series 220 heavy-duty knife grinder, along with complete specifications.

Pneumatic Conveying Systems. Convair Corp., 4156 Library Rd., Pittsburgh 34, Pa.—6-page Bulletin No. 104 describes pneumatic conveying systems for all industry. The basic components comprising the necessary equipment for practically all pneumatic conveying operations are illustrated. Numerous sketches show the various applications of these conveying systems. A few of the many materials handled in Convair systems are listed.

Stainless Steel Thermometers. W. C. Dillon & Co., Inc., 14620 Keswick St., Van Nuys, Los Angeles, Calif.—4-page Bulletin No. 3 describes the Dillon stainless steel thermometer, listing its many features. Three popular dial sizes are shown. A phantom view clearly illustrates all working parts in the thermometer. A price list is included.

Cranes. Thew Shovel Co., Lorain, Ohio—This 12-page picture book shows the varied applications of the Thew-Lorain crane line on docks, barges and ships. Full 8 x 10-inch pictures and short job descriptions make the book interesting and easy to read.

Sectional Cascade Coolers. National Carbon Co., Div. of Union Carbide & Carbon Corp., 30 East 42nd St., New York 17, N.Y.—The new design of "Karbate" sectional cascade coolers, Series "CC", is fully described and their applications outlined in catalogue section S-6820. The three standard sizes are illustrated by dimensioned engineering drawings, and the features, common to all sizes, are explained. The catalogue section also contains information to aid in the selection of these sectional cascade coolers for the cooling of corrosive liquids and gases, complete with tables of dimensions and specifications, as well as nomographs for determining cooling water requirements, over-all heat transfer coefficients, and required cooling surface.

Latices. Monsanto Chemical Co., Plastics Div., Product Development Dept., Springfield, Mass.—Up-to-date technical information on Lustrex latices, aqueous dispersions of styrene resins, is found in 16-page Production Information Bulletin No. 58. New compounding data on the latex series are featured. Included are discussions of plasticizing and pigmenting methods. Also featured in the bulletin are tables and curves on the physical properties of the latex films. Eleven diverse uses for Lustrex latices are suggested.

Polyvinyl Acetate Copolymer. American Polymer Corp., Peabody, Mass.—2-page Technical Data Sheet No. P-39 describes Polyco 497, an alkali-soluble polyvinyl acetate copolymer in water dispersion, including properties and suggested uses.

Steam & Liquid Control Equipment. O. C. Keckley Co., 400 W. Madison St., Chicago, Ill.—Catalogue No. 63, containing 60 pages, describes Keckley's complete line of steam, gas, air, oil and water regulating equipment, including complete specifications, operational data and prices of pressure regulators, temperature regulators, strainers, water gauges, etc. Useful charts are included. Capacity tables are presented to simplify the selection of proper sized regulators for a wide variety of steam, water and air services. There are also flange charts, a table of steam pressures and corresponding temperatures, and a table of water heads and equivalent pressures.

Riveted Roller Chains. Chain Belt Co., Baldwin-Duckworth Div., Springfield 2, Mass.—The improved Baldwin assembly riveted roller chain is described in 23-page Bulletin No. 52-2. One of the highlights of the book is the graphic section on how the chain is made up (not cut up) to any length. Features of the chain and the exclusive Baldwin-Rex single pin coupler link are illustrated and described. Assembly diagrams and charts for all size chains are presented, as well as list prices and boxed assembly specifications. List prices, strengths, dimensions and weights of standard roller chain are also given.

Electrical Insulations. Johns-Manville, 22 East 40th St., New York 16, N.Y.—"Quinterra and Quinorgo" is the title of a new 32-page publication which gives complete information about these electrical insulations made of purified asbestos—why they were developed, what their characteristics are, and where they may be used to advantage. In addition to photographs, many of the picture stories have sectional diagrams showing how, in a single piece of equipment, Quinterra and Quinorgo are used in many different places. The book concludes with a description of allied products and composites or laminates that utilize Quinterra and Quinorgo but are manufactured by others.

Stress Rupture of Tubing Steels. Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.—A new data card, known as TDC-153, presents stress rupture data on a number of B & W Croloy tubing steels and other materials designed for high temperature service.

General Manager

A General Manager is required for the Tasman Pulp and Paper Company Limited of Auckland, New Zealand. The Company, which is one of the largest in New Zealand, has a nominal capital of £. 6,000,000, some of which has been subscribed by the New Zealand Government. Contracts have been let for the erection of the plant and for the purchase of the major items of equipment. The pulp, paper and sawmills, which will have a capacity of 75,000 tons of newsprint and 72,000,000 bd. ft. of timber annually and 150 tons of kraft pulp daily, will be situated alongside the township of Kawerau in the Bay of Plenty, North Island, twenty miles from the town of Whakatane and within fifty miles of Rotorua and Tauranga. The company requires a man of the highest calibre with a proven record in the management of a large scale commercial enterprise, with the ability to lead and conduct the affairs of the Company on the highest level. Previous experience in the pulp and paper industry is desirable, but not essential.

A substantial salary will be paid: duties will commence in New Zealand within twelve months; housing available, and first-class fares to the successful applicant and his family will be paid. Applications will be treated in the strictest confidence and should be made in duplicate to the Chairman of Directors, Tasman Pulp and Paper Company Limited, Private Bag, Auckland, New Zealand, and should be accompanied by copies of recent testimonials and a photograph.

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MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

The following are quotations to mills, f.o.b. New York:

No. 1 White Shirt Cuttings	12.50 to 13.50
New Unbleached Muslins	14.00 to 15.00
Fancy Shirt Cuttings	6.75 to 7.00
No. 1 Percales	6.75 to 7.00
No. 1 Washables	3.75 to 4.00
No. 1 Light Silesias	8.00 to 8.50
No. 1 Light Prints	6.50 to 6.75
Light Flannelettes	8.00 to 8.50
Cottonades	4.00 to 4.25
Blue Overalls	7.00 to 7.50
Blue Cheviots	7.00 to 7.50
Canton Flannels, Bleached	11.00 to 11.50
Canton Flannels, Unbleached	11.00 to 11.50
Osnaburg Cuttings	8.00 to 8.50
Underwear Cuttings, Bleached	14.50 to 15.50
Underwear Cuttings, Unbleached	14.50 to 15.50
Khaki Cuttings—	
Sun Tan	8.50 to 9.00
Mixed	4.00 to 4.25
Linen Cuttings—	
American	8.00 to 8.50
White	14.00 to 15.00
Grey	14.00 to 15.00

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Roofing—	
No. 1	1.25 to 1.35
No. 2	.95 to 1.05
No. 3 and 4	.80 to .90
Twos and Blues—	
Repacked	2.25 to 2.50
Thirds and Blues—	
Repacked	2.00 to 2.25
Miscellaneous	1.75 to 2.00
Whites, No. 1—	
Repacked	5.50 to 5.75
Miscellaneous	4.75 to 5.00
White, No. 2—	
Repacked	4.50 to 4.75
Miscellaneous	3.75 to 4.00

RAGS (Foreign)

ex dock New York City
NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City
OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shoppers	

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	4.75 to 5.00
Domestic	4.75 to 5.00
Wool Tares—	
Light	5.50 to 5.75
Heavy	5.75 to 6.00
No. 1 Scrap Bagging	4.25 to 4.50
Manila Rope—	
No. 1 large	7.00 to 7.50
No. 1 small	6.00 to 6.50
Sisal Rope—	
No. 1 large	6.00 to 6.25
No. 1 small	5.50 to 5.75
New Burlap Cuttings	6.50 to 7.00
Jute Threads—	
Foreign (Nom.)	6.75 to 7.25
Domestic	6.75 to 7.25
Strings—	
No. 1 sisal	5.25 to 5.50
No. 2 sisal	4.75 to 5.00
Soft jute	5.25 to 5.50
Mixed	3.00 to 3.25

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

	per ton
Shavings—	
Hard White Env. Cuts	115.00 to 125.00
Hard White No. 1	85.00 to 90.00
Soft White, one-cut	70.00 to 75.00
Soft White, No. 1	55.00 to 60.00
Coated Soft	40.00 to 45.00
Fly Leaf No. 1	25.00 to 30.00
Fly Leaf, Woody No. 1	25.00 to 30.00
No. 2 Mixed Col. Woody	20.00 to 25.00
Flat Stock—	
No. 1 Heavy Books and Magazines, Repacked	20.00 to 22.00
Mixed Books	14.00 to 15.00
Ledger Stock—	
No. 1 White	55.00 to 60.00
No. 1 Mixed (Colored)	35.00 to 40.00
Manilas—	
New Env. Cuttings	65.00 to 70.00
New Env. Cuts, One-Cut Extra Manilas	22.50 to 25.00
Manila Tab Cards, Free of Ground Wood	65.00 to 70.00
Colored Tab Cards	45.00 to 50.00
Kraft—	
New Envelope Cuttings	65.00 to 70.00
Tripled Sorted No. 1 100%	35.00 to 40.00
No. 1 Old Assorted	27.50 to 32.50
News—	
White Blank	55.00 to 60.00
Overissue	22.00—
No. 1 Folded	15.00—
Old Corrugated Containers	26.00—
New Jute Corrugated Cuts	28.00—
Mill Wrappers	17.00—
New Board Chips	14.00—
No. 1 Mixed Paper	13.00—

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f.o.b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.55—
Ground, cwt.	3.85—
Powdered, cwt.	4.70—
Blanc Fixe—	
Pulp, bulk, ton	100.00—
Dry, barrels	105.00—
Bleaching Powder—	
Drums, cwt.	5.00 to 6.00
Casein (Domestic Standard)	
30-80 mesh (bags), lb.	
80-100 mesh (bags), lb.	28.00—
Argentine, lb.	22.00 to 23.00
China Clay—	
Domestic Filler Bulk (mine) ton	10.00 to 15.00
Domestic Coating Bulk (mine) ton	17.00 to 25.00
Imported (ship side) Bulk (lump) ton	20.00 to 30.00
Chlorine—	
Tanks cars (wks) cwt.	2.90—
Gelatine (silicin), lb.	1.25 to 1.35
Glyc. (C.P.) drums, lb.	44.00 to 44.50
Litharge, powd. bbl. lb.	.15¼ to .16¼

MARKET QUOTATIONS

Rosin (Gum)—	New York, per 100 lbs.
E	8.40—
F	8.40—
G	8.40—
WW	8.60—
Rosin (Wood), carlots, F.O.B. South	6.50—
Salt Cake—	
Dom. bulk (wks) ton	19.00 to 23.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	22.00—
Soda Ash—	
Bulk (works) cwt.	1.45—
Paper bags, cwt.	1.65—
Soda (Caustic)—	
Solid drums, cwt.	3.70 to 4.45
Ground and flake, drums, cwt.	4.10 to 4.85
Sodium Silicate—	
60 deg. 55 gal. drums, (works) cwt.	1.60 to 1.70
40 deg. 35 gal. drums, (works), cwt.	1.30 to 1.40
Starch—	
Pearl, 140 lb. bags, cwt.	6.39—
Pearl, barrels, cwt.	6.39—
Paper (Sp.) bags, cwt.	6.39—
Powdered, barrels, cwt.	6.60—
Sulphur (Crude)	
(Mine) bulk, long ton	25.50 to 27.50
Talc—	
Dom. 100 lb. bags (mine) ton	35.00 to 38.00
Canadian	35.00 to 45.00
Titanium Dioxide—	
Barium Pig. bbls., lb.	.21 to .21½
Calcium Pig. bbls., lb.	.21 to .21½
Zinc Sulphide, bbls., lb.	11.50 to 11.75

WOOD PULP

Quotations on domestic and Canadian wood pulp, dollars per short air dry ton, delivered consuming mills including basic freight allowances, follow:

Bleached Sulphite	140.00—
Bleached Sulphite, Canadian	140.00—
Unbleached Sulphite	120.00—
Unbleached Sulphite, Canadian	120.00—
Bleached Soda	140.00—
Bleached Soda, Canadian	140.00—
Kraft, Bleached	145.00—
Kraft, Bleach., Southern	142.50 to 150.00
Kraft, Bleach., Canadian	145.00 to 150.00
Kraft, Unbleached, Northern	132.50—
Kraft, Unbleached, Southern	100.00—
Kraft, Unbleached, Canadian	100.00 to 125.00
Kraft, Semi-Bleached, Southern	140.00—
Sulphite Screenings	72.50—
Sulphate Screenings	67.50—
Groundwood	82.50 to 87.50

Quotations on imported wood pulp, dollars per short ton, on dock American Atlantic ports with varying freight allowances, follow:

Bleached Sulphite, Swedish	130.00 to 140.00
Bleached Sulphite, Norwegian, freight allowed	140.00—
Bleached Sulphite, Finnish, freight allowed	140.00—
Unbleached Sulphite, Swedish	110.00 to 115.00
Unbleached Sulphite, Finnish, freight allowed	120.00 to 125.00
Kraft, Unbleached, Swedish	100.00 to 105.00
Kraft, Unbleached, Finnish, freight allowed	105.00 to 135.00
Kraft, Bleached, Swedish, on dock	137.50 to 142.50
Kraft, Bleached, Norwegian	

PAPER

Boards—

Prices per ton, delivered, 10 tons or more:

Plain Chip	70.00—
News vat lined chip	82.50—
Filled news	82.50—
Solid news	85.00—
White vat lined chip	115.00—
Chip tube and can stock	90.00—
Single manila lined chip	120.00—
Single jute lined chip	115.00—
White patent coated:	
.020	155.00—
.018	157.50—
.016	160.00—

Book Paper—

Coated two sides	
70 lb. No. 2 enamel, 25x38-500, trimmed 4 sides	4 cases $17.25 Carloads $16.30
45 lb. enamel, 25x38-500, trimmed 4 sides	4 cases $13.05 Carloads $12.10
Uncoated	
55 lb. No. 2 offset, 25x38-500, trimmed 4 sides	4 cases $14.80 Carloads $13.85
50 lb. A Grade English Finish, 25x38-500, untrimmed	4 cases $14.05 Carloads $13.10
20 lb. envelope, 17x22-500, untrimmed	Carloads $12.40
16 lb. tablet, 17x22-500	Carloads $11.35

Rag Content Bond—

Extra 100% rag	70.45—
100% rag	62.65—
75% rag	48.15—
50% rag	38.90—
25% rag	31.75—

Rag Content Ledger—

Extra 100% rag	72.65—
100% rag	63.90—
85% rag	52.50—
75% rag	49.40—
50% rag	40.20—
25% rag	33.00—

Sulphite Bond—

Air dry bond (Watermarked)	19.00—
No. 1 bond (M.F. watermarked)	15.00—
No. 2 bond (M.F. watermarked)	14.00—
Plain bond (M.F. unwatermarked)	14.00—

Sulphite Ledger—

No. 1, M.F. watermarked	20.50
No. 2, M.F. watermarked	19.50
Plain, M.F. unwatermarked	19.00

News—	per ton
Rolls, Standard (Contract)	125.00 to 126.00
Rolls (Spot)	(Nominal)
Sheets	138.00—

Tissues (Carlots)—	per ream
White No. 1	1.75—
White No. 2	1.35—
Bleached Anti-Tarnish	2.20—
Colored	2.00—
Anti-Tarnish Kraft	1.65—
Manila	2.00—
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.90—
Napkins, full crepe and embossed (12½ lb. to M shts.) per cs.	.90—
Toilet, Bleached (M shts.) per cs.	9.35—
Toilet, Unbleached (M shts.) per cs.	7.90—
Towels	per case
Bleached	6.80—
Unbleached	5.90—

Wrappings (Kraft)—	per cwt.
Standard wrapping	7.75—
Butchers, counter rolls	8.25—
Standard bag, mill rolls	7.50—
Shipping sack, mill rolls	7.75—
Gumming, mill rolls	8.00—
Asphalting, mill rolls	7.75—
Envelope, mill rolls	9.25—

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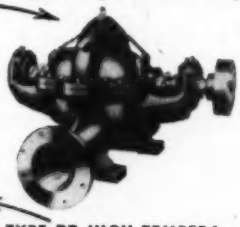
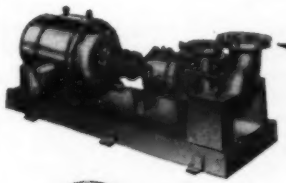
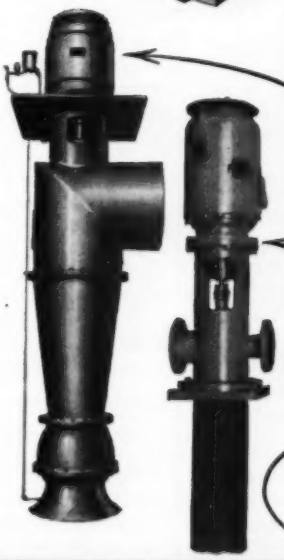




TYPE PR HIGH TEMPERATURE HIGH PRESSURE PROCESS PUMP. Heavy duty, center-line-mount, single stage, modern process pump for pumping hydrocarbons, water and chemical solutions at high temperatures, pressures.



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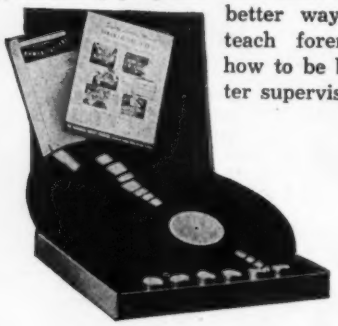

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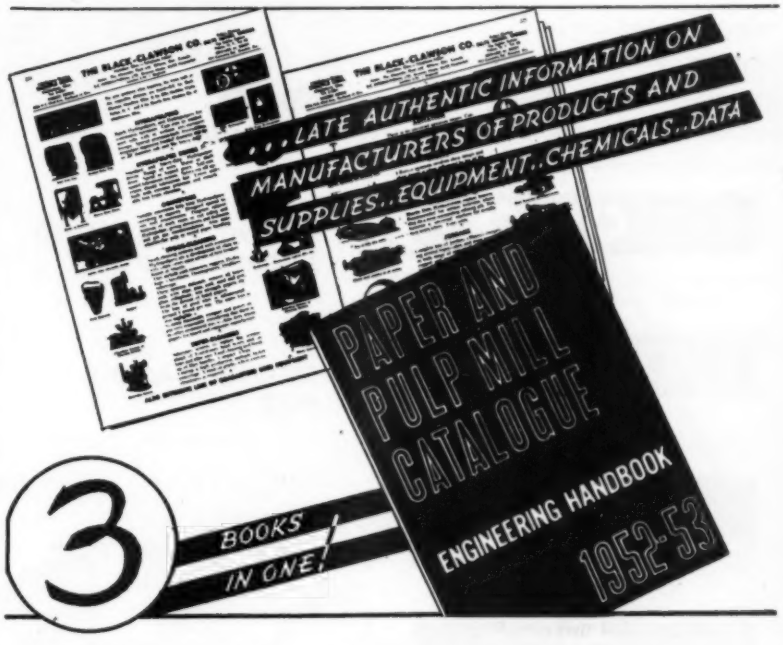
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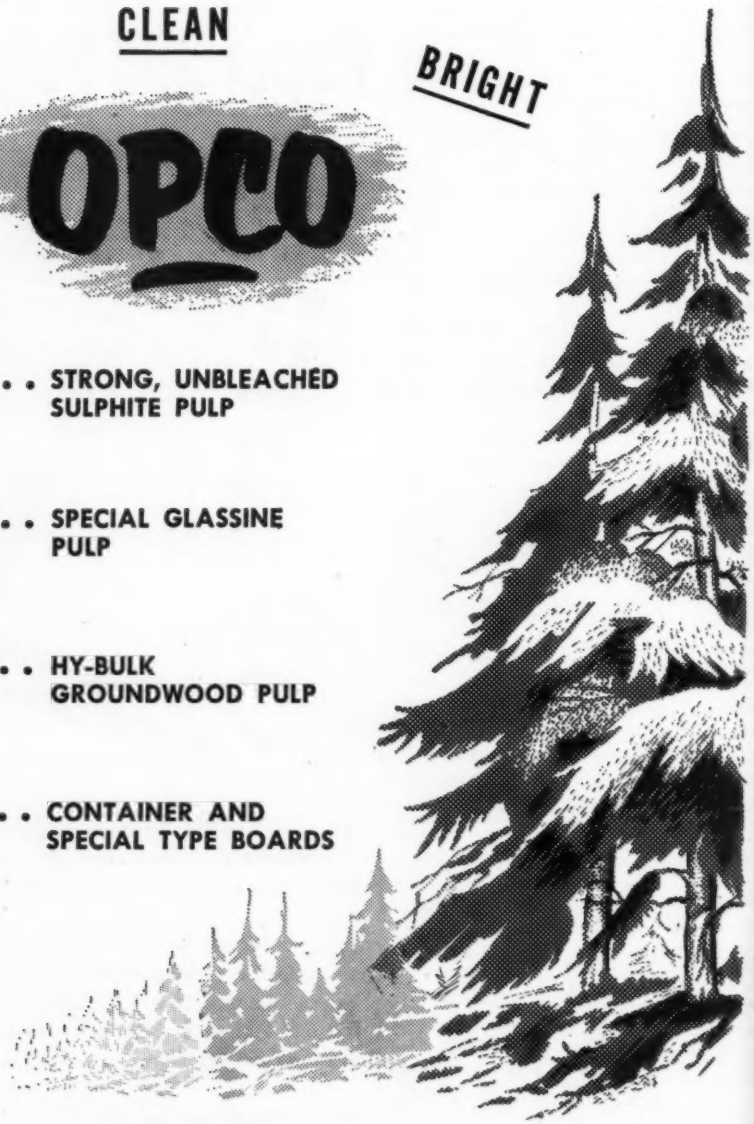

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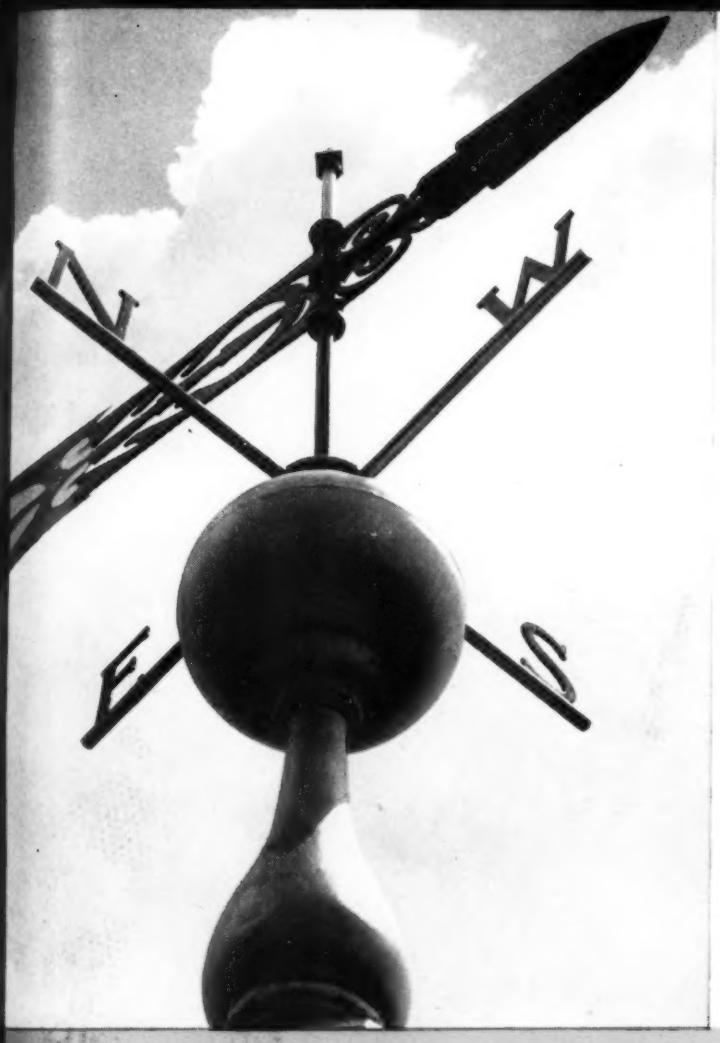

A Four-Way Selection

This photograph of a weather vane seems a good way to point out the fact that there are four different types of Midwest Welding Elbows (see below). These are more types than are manufactured by any other company. This greater selection is important to users of welded piping because it gives the engineer greater latitude in piping design and permits improvements and economies not otherwise possible in welded piping systems. For more information on this subject, ask for Catalog 48.

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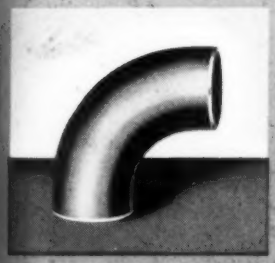

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Same radius as ASA but tangent equal to 25% of nominal pipe size on each end. Saves pipe, layout and welding time. Costs no more than ASA. Sizes to 24".

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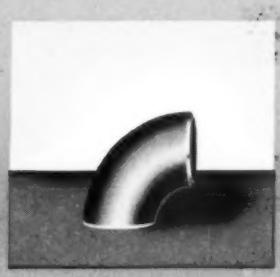
Dimensions conform to applicable size range of American Standard for Butt-Welding Fittings. ASA B16.9. Tolerances much less than allowable. Sizes to 26".



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Recommended where space is limited. Sizes to 30". Also available with "Long Tangents" in sizes 14" to 30".

MIDWEST REDUCING

Takes the place of a straight size elbow and a reducer. Eliminates one weld, reduces pressure drop, easier to insulate. Sizes to 12", reductions to half size.

MIDWEST WELDING FITTINGS

IMPROVE PIPING DESIGN AND REDUCE COSTS

Corrosive Valve Services?

try this combination of economy and corrosion-resistance

LUNKENHEIMER "CAUSUL" METAL

In corrosive valve applications, trim is a most important factor. If you can get *maximum* corrosion resistance in the trim, combined with *useful* corrosion resistance in a less expensive body, you can save money in most services.

That is exactly the combination you get in "Causul" Metal Valves. Trim is available in either Type 316 Stainless Steel or Monel Metal — providing the best corrosion resistance you can buy. "Causul" Metal bodies and bonnets are less expensive than all-Monel or all-Stainless and *have been used successfully for more than 20 years* in a wide variety of services. They are much more resistant to corrosion than iron valves . . . much tougher, too. And the problems of electrolytic corrosion between seating and body materials do not exist in "Causul" Metal Valves.

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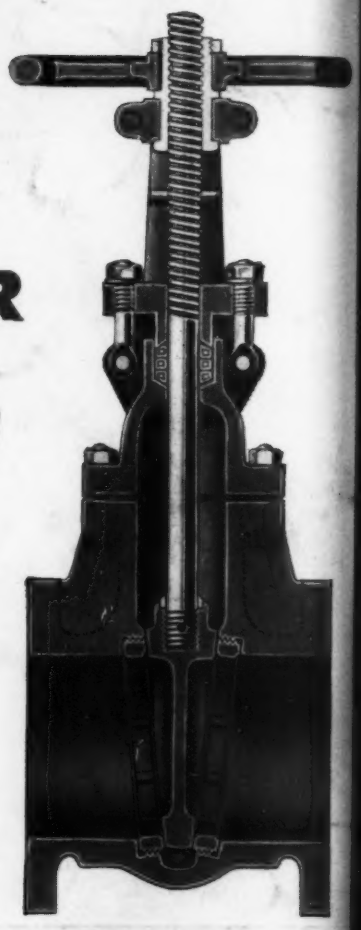

Fig. 1639-8—Gate Monel Trim

Fig. 1847-4—Gate 18-8 Mo Stainless Steel Trim

200 lb. W.O.G.

TYPICAL APPLICATIONS

OIL REFINERIES — Sludge and recovery acids, wash liquors, sour crudes, sulphuric acid, caustics, and certain distillates.

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Fig. 1708-8—Gate Monel Trim

Fig. 1845-4—Gate 18-8 Mo Stainless Steel Trim

225 lb. W.O.G. Screwed

Fig. 1709-8—Gate Monel Trim

Fig. 1846-4—Gate 18-8 Mo Stainless Steel Trim

175 lb. W.O.G. Flanged

LUNKENHEIMER

THE ONE *Great* NAME IN VALVES

L-453-B

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